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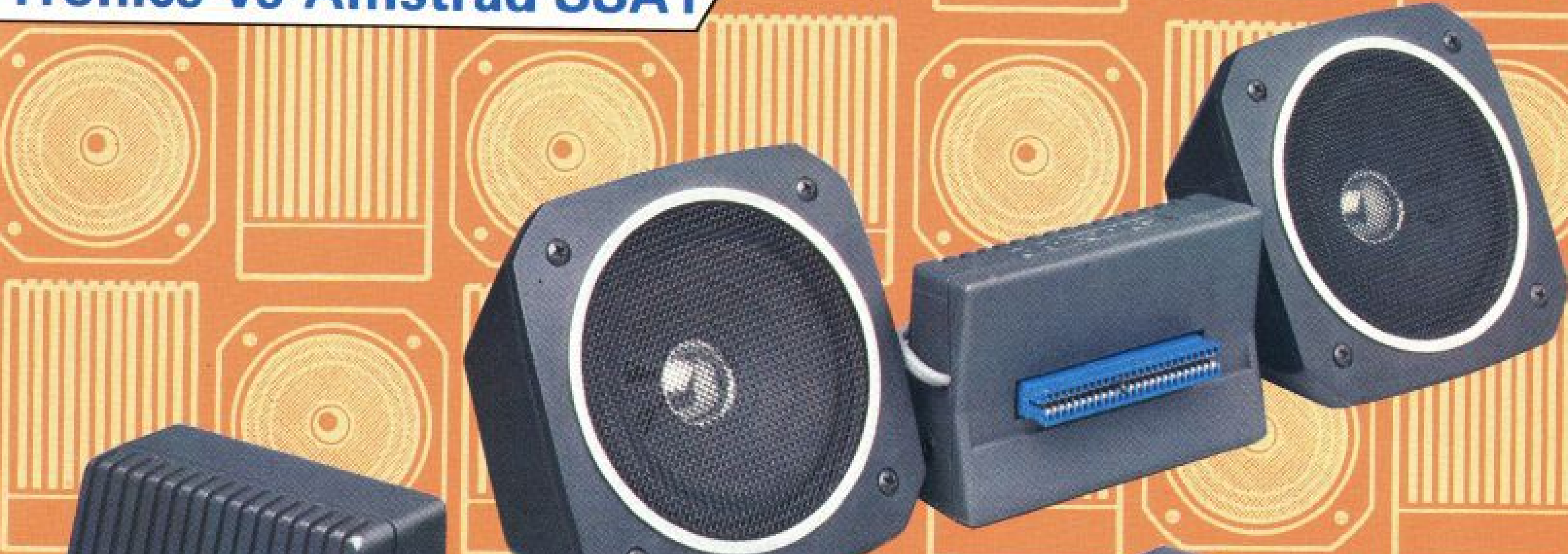
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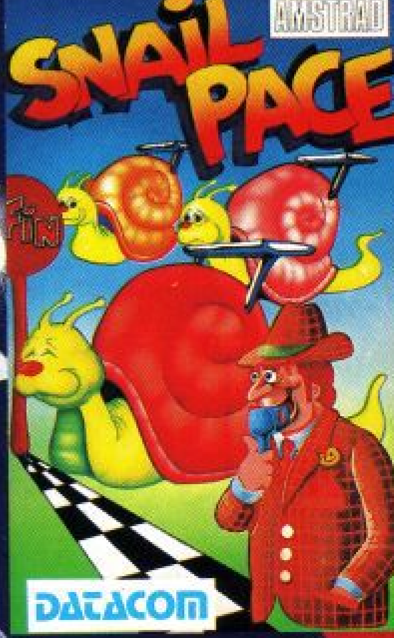
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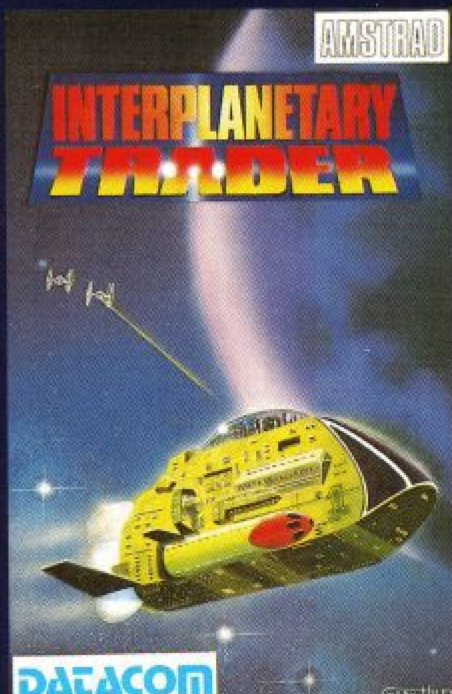
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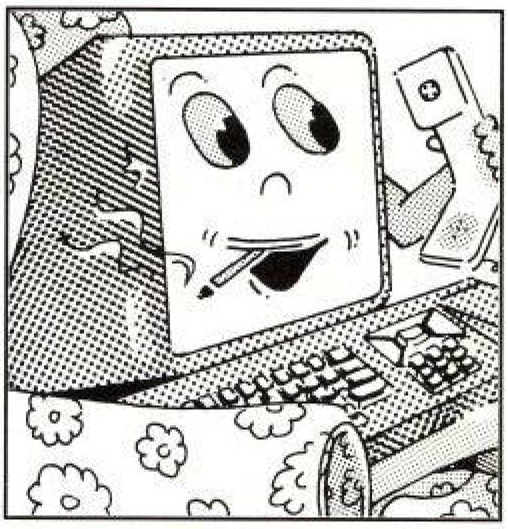
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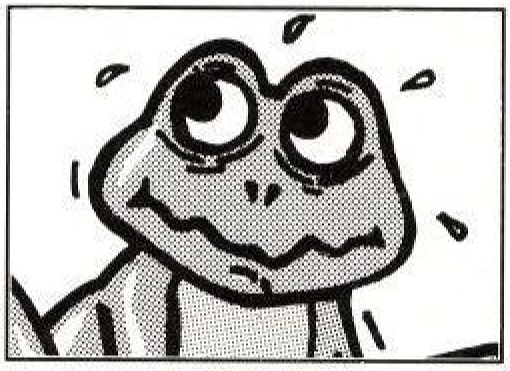
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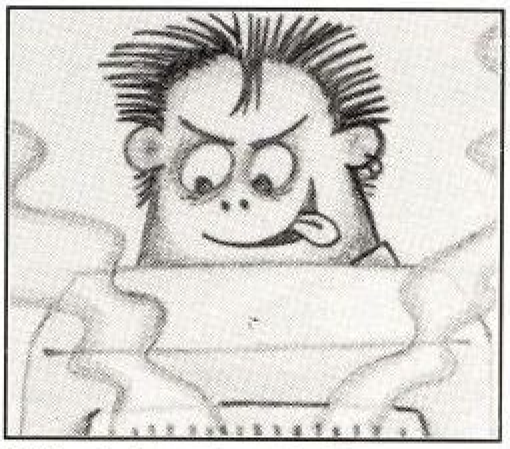
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Amstrad User is the OFFICIAL magazine for users of the Amstrad CPC464 and CPC664. It is published monthly, the next issue will be on sale from May 11th 1985. Back issues are available from Amsoft Mail Order at £1.20 each (including postage).



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USER NEWS

CP/M 86 For Amstrad Computers

Screens Microsystems are now working on an 8086 second processor for the CPC464 and CPC664 computers. The device will allow the user to expand the memory of the system to 128K and will run all CP/M 86 software. This will overcome the shortcomings of the 38K TPA when using the standard CP/M 80 system. Screens hope to be able to supply DBASE II and the "Perfect" suite of software to run with the system. The board is still at the prototyping stage but the first production units should be available in August.

Also available from Screens is a 5 1/4 inch disk drive. This will allow users who have another CP/M machine to transfer files between say an Epson QX10 and a CPC464. It is possible to have the 5 1/4 inch drive as drive A by using the Screens interface. This does not support Amsdos but will run all CP/M programs. The device will cost £300. Amstrad User will test the device as soon as we can. You can contact Screens on 09274 20664

Knock - Out.

Elite - the software house, not to be confused with Elite the game - are to bring out a new title for Amstrad Computers. Frank Bruno's boxing is similar to the arcade game "Punch out". Players control a boxer against a variety of opponents. This game sounds as though it will do more for joystick sales than Daley Thomsons Decathalon. The software should be on sale at the end of July at '8.95 in the distinctive hologram labelled packs. The great man himself has endorsed the program and I'm not about to argue with him.

AMSTRAD COMPUTER USER

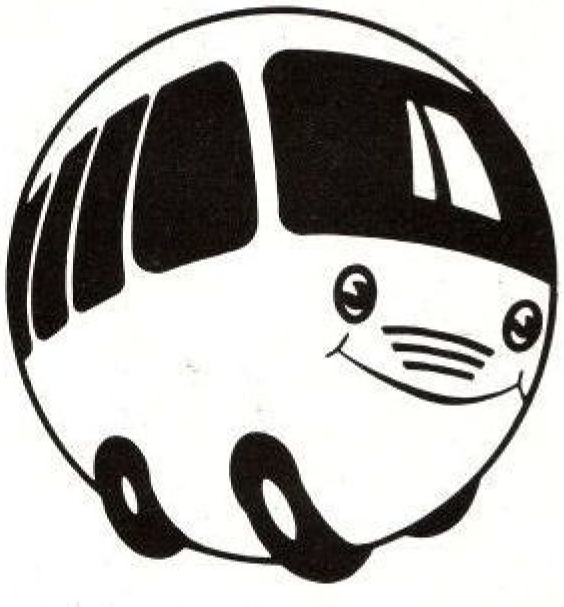
Overseas Subscriptions.

Due to popular demand Amstrad Computer User is now available direct to overseas readers. The rates for 12 issues are as follows:

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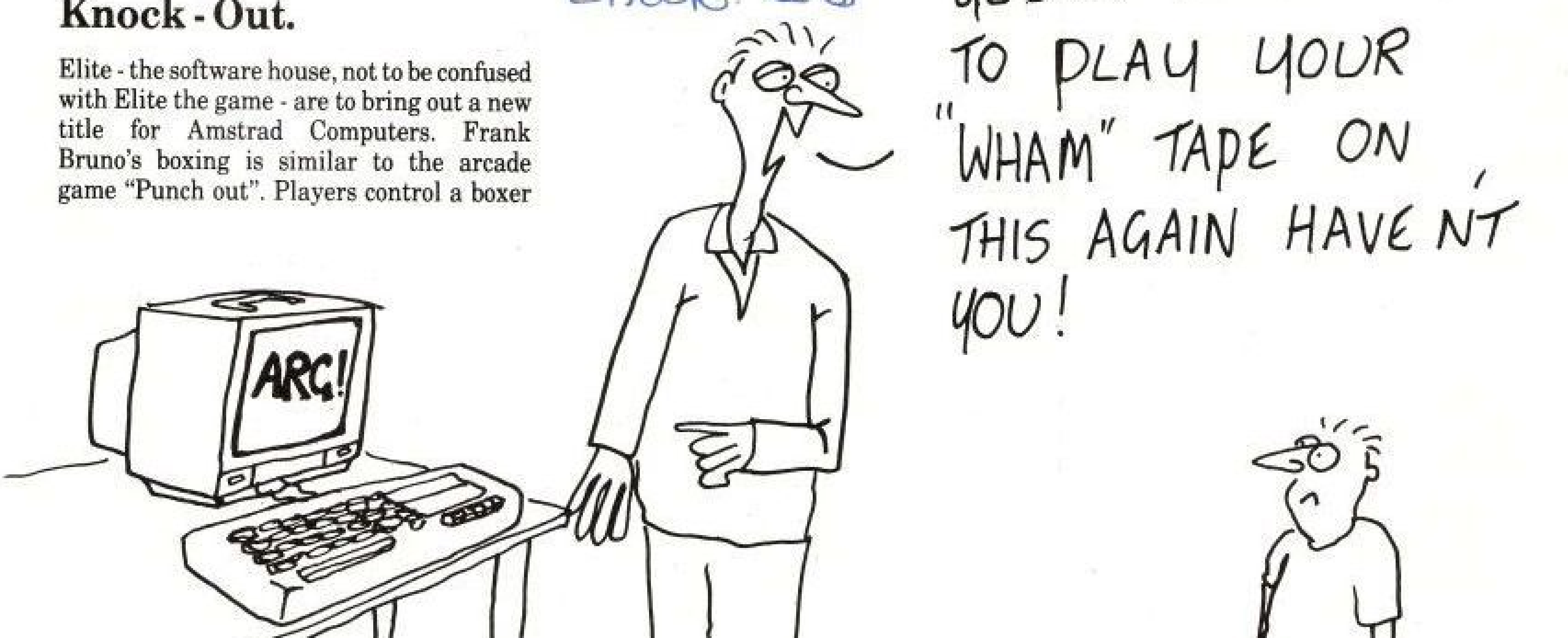
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Double-decker software.

Bubble Bus is a cute name for a software house. They have published a 3D Ladders and platforms game. Called Hi Rise which features Harry the builder. His task is to build a frame within a day. Both energy and paint are limited. You can move Harry from four different view points. The program is written by Nick Strange - famous for his "Hustler" program. Hi Rise will be available at the end of July. Also new from bubble bus is a set of business utilities called Clock-it, Use-it, Grap



In RAM no-one can hear you screem.

Some games are very difficult to classify. Alien from Argus Press Software is one of these. If cornered I suppose I would call it a strategy game. It is, however, very complicated. You have two objectives, either to escape (with the cat if possible) or to kill the parasitic monster. This may well mean nothing to you if you have not seen the X-rated film, but those who have will know the terror of half knowing where the monster lurks on the ship. They will also know how the crew react. Perhaps every copy should be supplied with a video tape or some cinema tickets. The program will be available from Amsoft very shortly.

Amsoft go for gold.

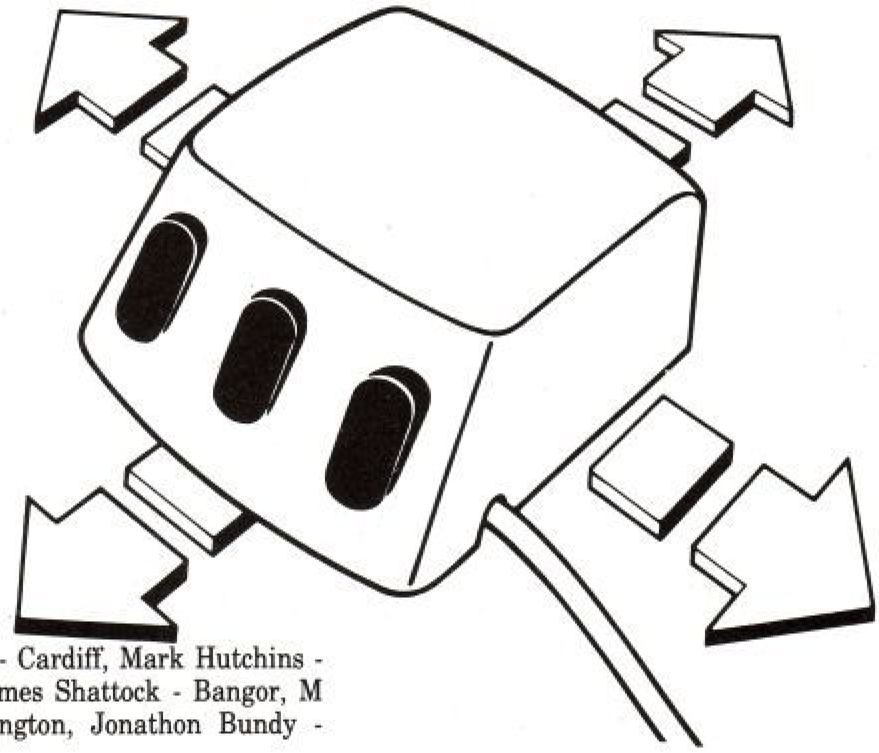
There is nothing new under the sun and whoever thought up the title of 'Amsoft Gold' is unlikely to be credited for originality. However the name does its job very well. Amsoft are to bring out some top quality software. This will be distingushed by the new name, new packaging and a higher price (well two out of three ain't bad -Ed). The first title to be launched is Sorcery II. This will be a disc based version of what is still reckoned to be the best game available on the Amstrad. Sorcery II will feature over 80 rooms, more monsters and better sound.

Risky Business.

Everyone likes to take the odd gamble, that is everyone except the people who earn their crust from others gambling, so the owners of casinos are going to be able to play safe. They will be able to install a CPC464 to see how much each table is taking (or losing) at the touch of a button. The system is networked and will supply the user with a running total of how things are going with special feature to take into account 'High rollers'. As always the house will be the winner.

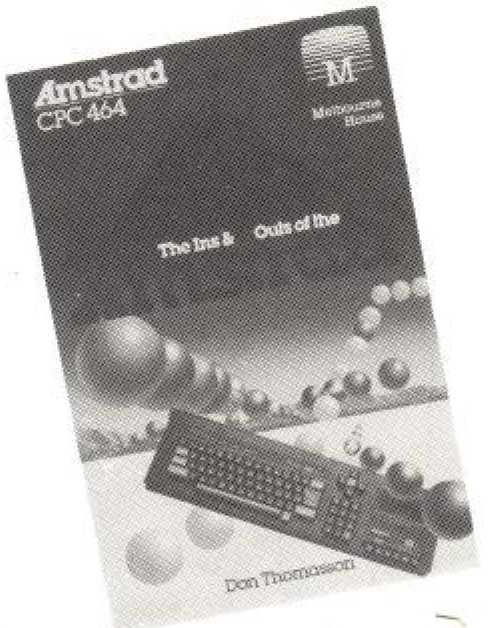
Melbourne House Winners.

For all of you who entered the Melbourne House Competition here are the winners:
Mr S Mozley - Sheffield, Charles H M Joynson - Bradford, A C Stevens - Leeds, B R Tranter - High Wycombe, R Craig -Ilkeston, Wai Tsang - Ipswich, N J F Markwick -Powys, N Hadi - Bristol, Monica Leiba -Carlisle, Steven Thompson -Thetford, Mr M Lowing - Carshalton, A M Veness -Sutton Coldfield, David Litherland - Bolton, Paul Harrison - Cwnbran, Jason Bloomfield -Ipswich, Adam Flynn - Kings Lynn, Michael Roy Jackson - Warrington, Robert John Taylor - Selston, A Matko -Glasgow, Ian D Webster - Warrington, Neil Casey -Waterfall, Claire Everett -Shepshed, Antony Welsh - Walsall, Andrew Sharp -Broxburn, E R Marks - Wellington, David Bell - York, Campbell Barr -Kilwinning, Mr



E V Browning - Cardiff, Mark Hutchins - Gillingham, James Shattock - Bangor, M Cullen - Darlington, Jonathon Bundy - Lingfield.
Each winner recive a copy of "The Ins and Outs of the Amstrad" by Don Thomasson.

The answers were as follows:
1,2 and 15 Sorcery
3 and 17 Splat!
4 Admiral Graf Spee
5 Harrier Attack
6 Pyjamarama
7 Flashman
8 and 16 Roland in Time
9 Roland on the Run
10 Hunchback
11 Roland Ahoy!
12 Quack a Jack
13 Jewels of Babylon
14 Screen Designer
18 Mutant Monty
19 Centre Court Hunchback
11 Roland Ahoy!
12 Quack a Jack
13 Jewels of Babylon
14 Screen Designer
18 Mutant Monty



WIMPs for the Amstrad

WIMPs stands for Windows, Icons, Mouse Programs and are the fashionable things with business computers. Apple have the Macintosh, Epson have Taxi and IBM have MS-DOS windows. Now the Amstrad is on the road to joining this crowd. Advanced Memory Systems who produced the AMX mouse for the BBC computer are in the throes of producing the Amstrad mouse. They claim that the package will be very similar to the one for the BBC. The AMX art package which will also be available has many features not usually found on 8 bit micros. Amongst these are a fill and unfill with stipples and pull-down menus. Features which all contribute to making the system more "user-friendly". The mouse and software should cost around £90 and be available in September. For those who are going to make the most of this device it is a bargain.

Pretty paint.

CRL have produced a painting package to allow you to design screens, characters and sprites. Multicoloured characters are supported with transparent inks. There should be a full review of this utility in a future issue. The "Amstrad Artist" costs £9.90 and comes on tape with a neat little manual.

The Hurricane Breezes In

Amsoft's original snooker game was a very polished affair -but when it was decided to upgrade the action with slicker ball movement and all round faster play thanks to speedier control responses, who else but Alex "Hurricane" Higgins could possibly be invited to lend his name to the game?

Amsoft's Hurricane Snooker game was given the once over by the past World Snooker Champion as the Hurricane whistled into Amstrad's Brentwood HQ to meet Amstrad Chairman Alan Sugar to settle the endorsement deal.

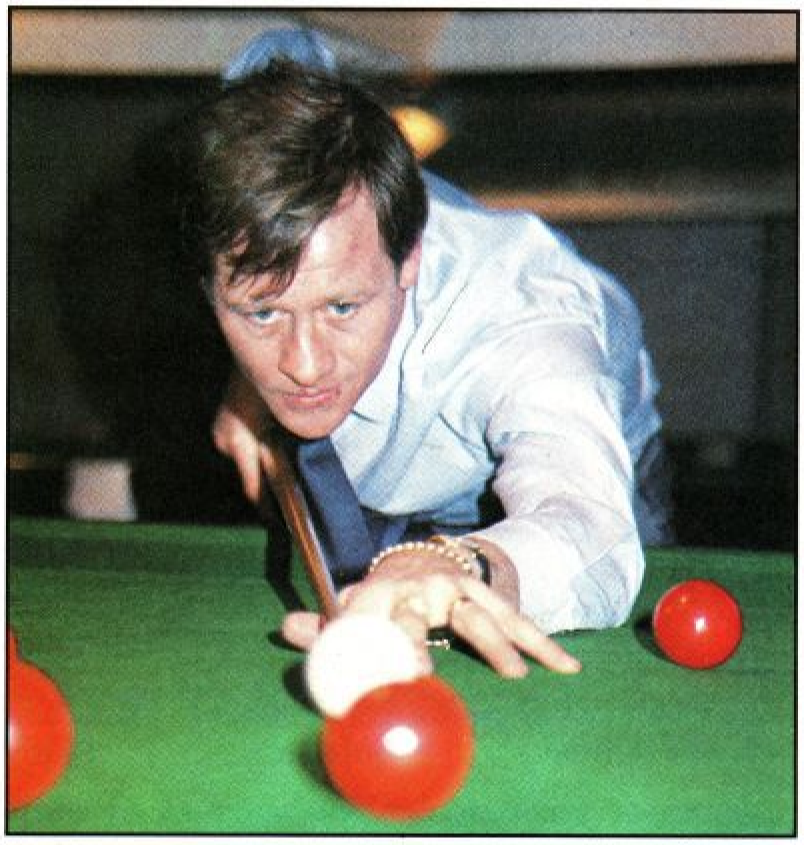


After a brief ceremony at Brentwood HQ, a photo session on the tables at nearby Abridge Country Club drew some surprised glances from the regulars on a Wednesday afternoon - plus the usual posse of autograph hunters who were duly obliged with the celebrity monica.

Knowledge that the competition snooker program was sold under the steely gaze of arch rival Steve Davis added to the occasion, although Higgins confessed that he doesn't actually own a home computer of his own, as he's too busy dashing about the country to get stuck into the finer points of programming. Maybe someone would like to sponsor a challenge match between messrs Higgins and Davis on computer snooker?

Having recently moved house to one with a substantial acreage of lawn, it looks as if the Hurricane's summer season





will be spent cruising across a slightly rougher green baize surface than the one in the Crucible as he pilots his newly acquired sit-on mower around the garden.

The new game features the original elegant scoring frame and numbered ball options for monochrome monitor owners, but with faster control and ball motion, coupled with a much larger 'target' marker.



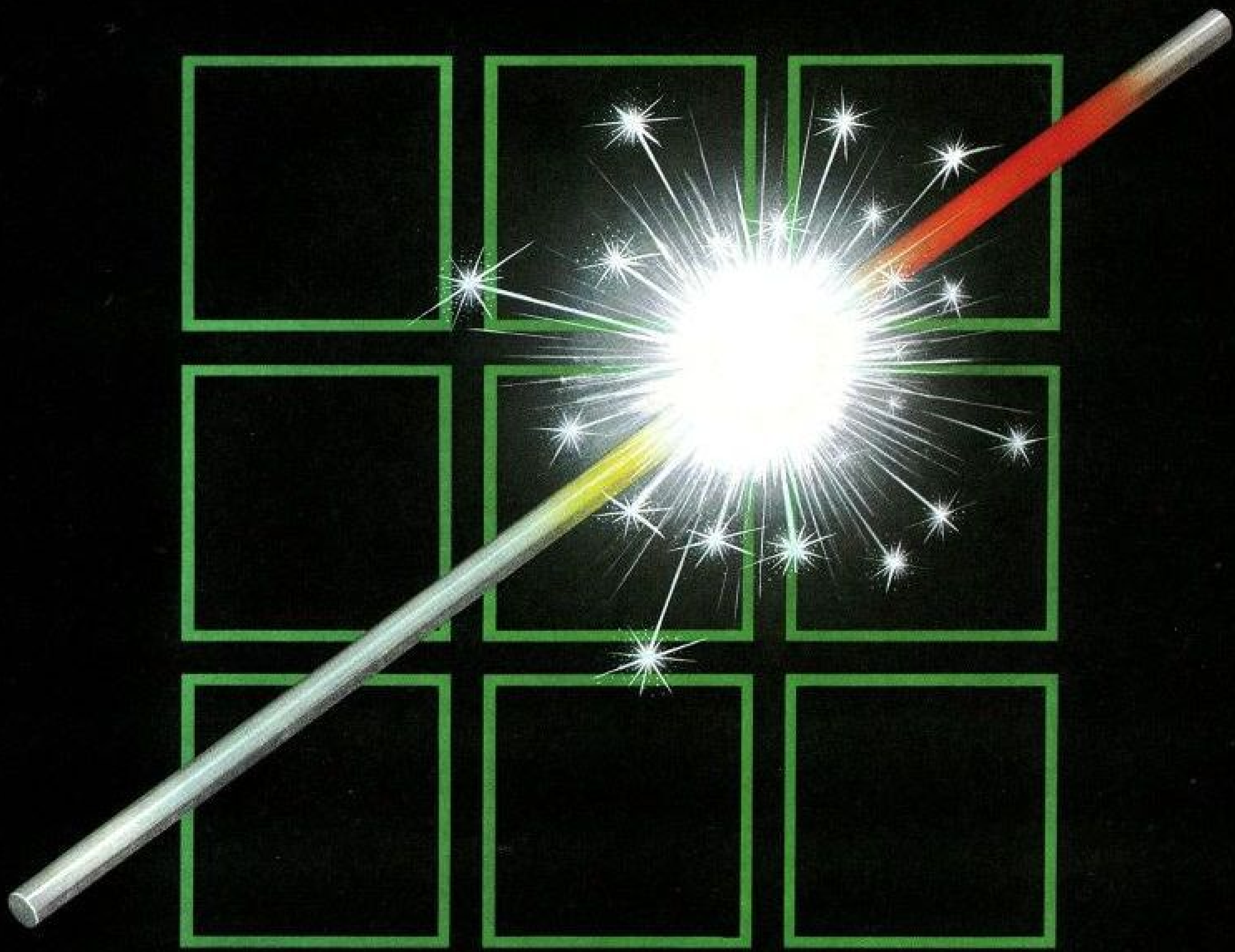
Another new product from Amsoft will be "Hurricane Pool", this will give you a chance to practice your computer cueing action at the popular American bar room game.

Both games will be enhanced by the addition of the Amstrad SSA1 speech synthesiser. If you pot the wrong ball the game will tell you. This means an end to sneeky cheating while your opponent isn't looking.

As with all Amsoft products "Hurricane Snooker" and "Hurricane Pool" will each cost £8.95 and should be in the shops very, very, soon.

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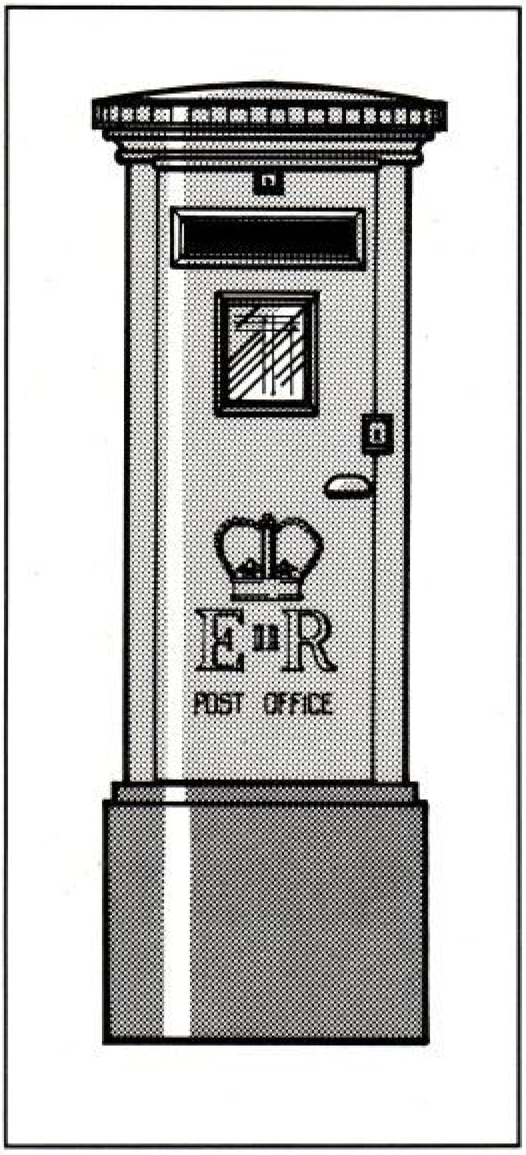
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Write to reply



Plugging Loud Bob

In answer to a letter appearing in the problems page of the May issue, by a Mr A.C. of Birmingham, I offer the following advice as suggested in the reply. Whilst I certainly agree that to utilise a different character matrix standard would be a most arduous task, but the Japanese seem to manage their character set in a small matrix of 8 x 8.

As an alternative I suggest that Mr A.C. purchases a 464/664 as it is the best home small office educational micro on the market; and if he ever persuades himself to take the micro to work and not leave it at home for his own personal use, he could do worse than purchase a character designing program and to complement it with a printer character designer.... I just happen to have written both of those.

With these programs he would be able to design the language fonts himself, to use as he sees fit, redefining the keyboard is no trouble and to print from right to left and vice versa would require a small amount of code patching the text handling calls where necessary to perhaps a custom word processor, a graduate computer software engineer should have no bother I would have thought.

If Mr. A.C. does buy a CPC464/664 then I would be happy supply FREE of charge a copy of PRINT with the AMSTRAD a versatile U.D.C. designer with functions for Rotate R/L, Inverse, Mirror H/U, Condense H/W, Enlarge H/W, Move B/S, Hex and Decimal parameters, output to printer, Tape, Disc, Screen, and the ability to design with cursor or Joystick 8 characters at once and move through a set of 256 characters. Saving these characters as a Binary or ASCII file or loading part completed sets for redefining. Also a copy of Scribe 464 a printer in graphics mode, even the dismal DMP1 on which this letter is written with (honestly). The program is supplied with 5 character sets from Data type to Gothic and included is a routine to convert a character set defined with Print with use with Scribe 464. There is also the ability to interface with Tasword 464 but unlike a Tasman's program, the DMP1 characters are normal height with a 60 chr width. Scribe 464 will allow up to 5 fonts in memory at any one time switching between fonts by one print command.

S. Potter.
Loud Bob Software
39 Church Walk
Brinsley
Nottinghamshire

ACU: We get a number of letters asking about foreign typefaces, and it seems as if Loud Bob, alias S Potter, is able to solve these problems.

Database

I have recently purchased your new Amstrad CPC464 home computer and I would like to say that I am very impressed with its design and also the enjoyment given to myself and my son and daughter.

However, my justification for purchasing a home computer goes beyond the ability of flying fighter planes, sailing submarines and managing football teams (although they are enjoyable and challenging).

My wife is a Deaconess with the Church of England and she is currently connected with a local parish. It is my aim to computerise her parish records, currently kept on a cardex system. These cards contain names, addresses, ages, details of the family, any remarks pertaining to church activities etc.

I would estimate that there are some 400 records. It would be important to flag certain entries, such as sorting to find families with young children, widows, old-age pensioners etc etc.

Could you please advise me whether a database would accommodate these needs? Also is there any other equipment (apart from a printer) that I would need?

B Wood.
Leigh on Sea.

ACU: We're quite safe to recommend Masterfile as the definitive CPC464 database program. Masterfile does all you seek, although as usual, we would recommend anyone with a serious application to use disc drives and not trust to the vagueries of cassette.

Give it some rabbit

I can thoroughly recommend to your readers the DK'Tronics speech synthesizer. The quality of the speech is quite remarkable even if it is somewhat oriental in intonation. Most importantly, the software supplied gives it amazing versatility; I managed to get Arnold to say "supercalifrag.......etc." with startling clarity! However I must admit that the spoken program listings sound like SerboCroat. A great bonus is the ability of the device to reproduce sound in stereo: this gives a quantum leap in the enjoyment of using the CPC464.

Not only is the CPC464 the best value-for-money on the market but so are its peripherals.

D.P. Stribley
Dunstable.

Camping it up with Amstrad

The idea of spending a week on an activity holiday devoted to mastering the use of microcomputers interests me, and I wonder whether you are of any such holiday organiser who has chosen the CPC464 to be the computer one of the computers available as I would of course prefer to learn on a similar computer to my own.

I would welcome an early reply in order that I can make a booking.

K Jackson
Liverpool

ACU: Seems like a good idea, any offers?

Continued on page 13

Dear Amstrad

It's good to see that more software is coming on the market which makes full use of the CPC464's excellent capabilities.

One major criticism I have concerns the problem of addressing graphics symbols when using printers other than the DMP-1. I have a CPA-80 which I consider to be superior in every way to the DMP-1 for text processing, but because of the 7-bit printer connection, I am unable to address and print graphic and other characters above chr$(127).

I am sure that there must be a large number of otherwise satisfied Amstrad users who are faced with a similar problem. Are you intending to release details of a "fix" to enable us to use our alternative printers to the full, or is there anyone "out there" who has already cracked the problem and is willing to share the solution via the letters page?

A.K. Shardlow
Birmingham.

ACU: *Many printers allow manipulation of the eighth bit using an escape code sequence -check your handbook. Other remedies include a separate 8 bit interface - there isn't any magic spell to conjure up the eighth bit with a POKE, since the limitation is in hardware not software.*

Precision

I have found that if you subtract a 2 fig decimal from a 2 fig number, the answer is always wrong e.g. PRINT 16-15.51 answer 0.489999998 is this a fault of the computer or am I doing something wrong.

K Davies
Cheshire

ACU: *Nope. It's an artefact of the way the computer does its sums, and emphasises that the handbook isn't wasting space when it says the BASIC is accurate to 9 decimal places. Use a PRINT USING format if you're really bothered.*

Exhibitionism

I am writing to you after hearing that you are to stage a CPC464 exhibition at Olympia later this year. Firstly, this is fantastic news but, secondly, why is admission to be restricted to over 16's only? I am fourteen and extremely upset that I will not be able to get in to see any of the new developments which I am sure will be present.

Please tell me why only over 16's will be admitted.

Another point, when will 5-a-side soccer be available? I understood the release date to have been the end of '84 but I cannot find it anywhere.

V. Merrell, Edmonton, N9.

ACU: *The plans for an Amstrad User exhibition have been floating around for a while now but not yet been finalised. If you would like one, write in and tell us what you would like to see there, where and when to hold it, and we shall see what can be done.*

The question of excluding under 16s is unlikely to arise, since it is a restriction placed primarily on trade exhibitions by such as the GLC who require different rules to be in force regarding fire exits etc. where a public exhibition is being held.

Modem

I am an information provider to Prestel and I have recently purchased an Amstrad CPC464.

I am trying to find out what modem and communication software is available that will enable me to communicate with Prestel and other databases. Also as an information provides to Prestel I would like to know if there is any off line editing software available for the Amstrad.

If you have any information or ideas on this I would be grateful if you could let me know.

R.W. Land
Herne Hill

ACU: *Contact Tandata, who have been threatening to market just such products in conjunction with MMG consultants.*

Printer pointers

I am thinking of buying a printer for my CPC464, please can you recommend one for me. It must have the following:

1) About £250
2) Friction feed
3) Can produce screen dumps & letter quality print out 4) Fonts can be enlarged or emphasised
5) At least 50 c.p.s.
6) Epson-Compatible
7) Supported by most software (work on Tasword, Tasprint etc.)

Can you also tell me what interface do I need and where can I get it from.

Lastly I am a draught enthusiast, I would like to know if there is a draught program available for the CPC464.

S. Law
Manchester

ACU: *The perennial printer question. The DATAC Panthers are very good but slightly more than your budget allows. The Brother M1009 is also good, but without an NLQ mode. The Mannesman Tally is good, but no NLQ.*

Personally, we'd look for higher speed (80-120 cps) for draft modes because you'd be surprised just how tedious it can be waiting for the printer to catch up.

Draughts anyone? (Didn't we publish a draughts program already?)

Manchester Conspiracy

We are a group of five Amstrad Computer Users who live close to each other and have been discussing whether to try and set up a local Amstrad Computer Users group. We have noticed that there happens to be rather a lot of Amstrad Computer Users in the North West, and quite a few Users under 18. The idea is to pass on computer hints and information. (Not to swap tapes and copy commercial software, of course). Plus as much info on the latest software and hardware that becomes available to the Users.

We have also been getting in touch with a lot of our local software and hardware stockists who have been giving us considerable help and would back our venture all the way. We have lots of ideas in the pipeline but before we can start to organise ourselves, we thought it best to write to you.

We would like to know if it is possible to quote written work from your magazine that has anything to do with soft/hardware games for the Amstrad Computer in a weekly newsletter. We would be grateful if you could keep us in touch with all the latest news and releases of the Amstrad Computer Software. We also think that there is a lot of talent in the North west and would like to see our Amstrad Computer Users produce good programs. We are not asking for finance, just to be able to do something that we enjoy and could benefit.

We are all unemployed and have had some time to learn on the computer and think if some of our ideas come about we may be able to pass on local info that might be of use to your magazine. Please try to help us with some advice on the best way to get our ideas working.

C. Heyliger (and others),
41 Millwall Close,
Gorton, Manchester, M18.

ACU: *With our limited resources, the best we can do is run a listing of local clubs and events in each issue of ACU. Local clubs tend to snowball once you have your first ten members, so it's likely you will be besieged by other interested owners reading this letter. Start organising straight away.*

Keep us up to date with your events -and by all means make brief references to features we publish, but remember our job is encourage users to buy this magazine, not to provide content for other publishers. (CWTA please note!)

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Let your Amstrad do the talking...

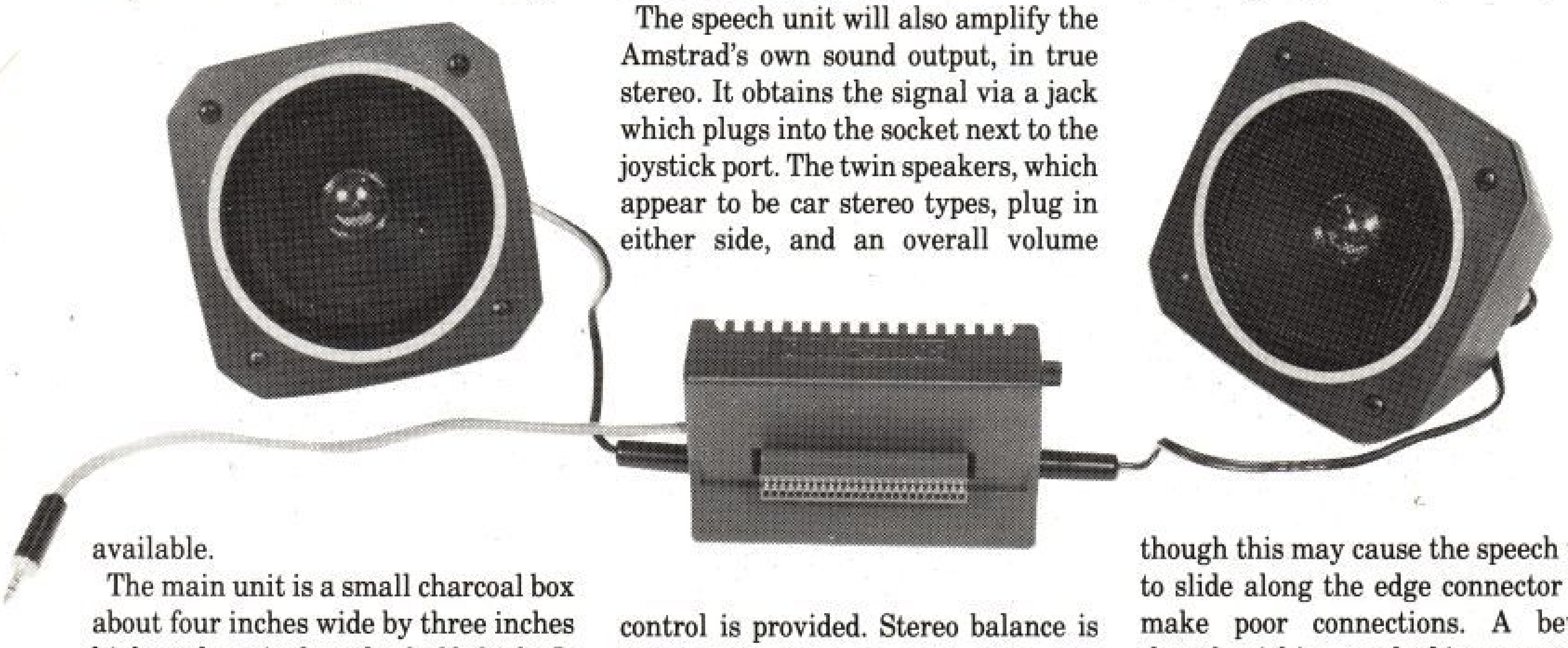
by Peter Green

Not so long ago, synthesized speech of any kind wasn't really feasible, even on the largest of computers. The extraordinary speed of research and development in the computing and electronics field now makes speech commonplace, and almost trivial, even on the humble home micro. Everything you need can now be obtained on a single chip, the SPO256, costing just a few pounds.

All you have to do is interface the thing to the computer of your choice, amplify its output and hook up a speaker. Now two companies have done just that for the CPC464.

DK'TRONICS SPEECH SYNTH

First on the speech scene were peripheral experts DK'Tronics, whose speech synthesiser was announced a few months ago as being the first add-on for the Amstrad. Production seems to have lagged, though, and it is only now that their synth is becoming available.



The main unit is a small charcoal box about four inches wide by three inches high and an inch-and-a-half thick. It plugs into the main expansion port on the back panel and has a through connector to allow the connection of other peripherals. The styling is excellent: the cross-section through the case is deeply angled so that it fits tightly against the contoured back of the 464, and the ventilating slots along the back of the computer are duplicated too. It looks more at home than Amstrad's own peripherals, and doesn't flex about in the same way as the floppy disc interface, despite the latter's contoured ribs.

The speech unit will also amplify the Amstrad's own sound output, in true stereo. It obtains the signal via a jack which plugs into the socket next to the joystick port. The twin speakers, which appear to be car stereo types, plug in either side, and an overall volume control is provided. Stereo balance is factory-set, just as well since the balance test program in the manual doesn't work.

Connecting up the unit revealed two problems. First, unless you perform surgery, you can't use the DK unit with the excellent Arnor ROM board reviewed last month. This is because DK have fitted the polarising key to the connector, but Arnor haven't cut the corresponding slot in their board.

And Arnor's board can't go in the back of the DK unit because it's too deep. One solution is to pull out the polarising key with a pair of pliers, though this may cause the speech unit to slide along the edge connector and make poor connections. A better, though trickier, method is to get a fine hacksaw or fretsaw blade and cut a slot in Arnor's board in exactly the same place as the one on the Amstrad edge connector.

The second problem is that the DK unit draws a lot of extra current. I couldn't use the unit and my floppy disc at the same time because the overload protection in the monitor shut down the power supply. I'm told that this only affects some Amstrads, but if you're one of the unlucky ones I don't know what the solution is.

The method of speech synthesis used by the SPO256 is allophone generation. Allophones are the phonetic building blocks of speech, the basic sounds that we string together to form words. Including a range of five pauses of various lengths, there are a total of 64 allophones. These are numbered, 0 to 63, so interfacing is simply a matter of providing a single I/O address for the chip. Speech is generated by writing a stream of single bytes (the allophone code numbers) to the chip, with handshaking via the same address.



So, we need a little software to control the flow of allophone numbers to the chip, and a lot of software to control what's actually being sent. DK'Tronics supply this on a cassette as a set of RSXs (resident system extensions, or | commands), so the facilities can be used equally well from BASIC or machine code.

The software asks you where you wish it to be located: suitable addresses range from 16384 to 39000. There is no default: you must type in a number. HIMEM is lowered and the RSXs installed above it. There are a total of six.

The software uses two buffers: one to hold the words, the other to store the allophone data to be output under interrupts to the chip. |SPON and |SPOFF are used to turn the interrupts on and off: this merely halts the transmission of data, so the buffer contents are left intact and the last allophone will sound continuously. |FLUS kills the speech and flushes the buffers completely.

If you are using the text-to-speech software, there are three modes, set by |OUTM plus a parameter. Mode 1 will only sound text which is in a PRINT statement and enclosed by ' marks (inside the normal " marks). Mode 2 says all printouts including listings, error reports and 'Ready', but without the text appearing on the screen. Mode 3 says everything and lets it appear on screen too.

The speed of the speech can be controlled by |SPED (why all these abbreviations to four letters? An RSX

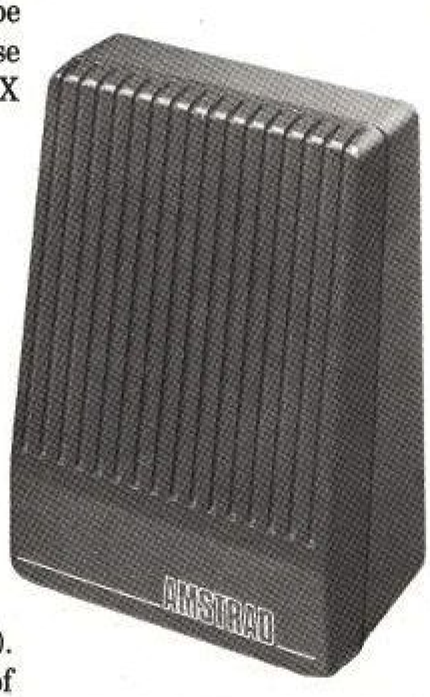


can have a command of any length). This doesn't affect the actual pitch of the voice, merely the time taken to sound each allophone. The range is 0 to 15, but only the smaller values are useful: at the slowest speeds, above 10, the allophones don't flow together very well and the speech is harder to understand.

Note that |SPED acts asynchronously with the data in the buffer: if you send some text to be said at one speed, then swap to a new speed and send some other text, the speed command acts instantly and all the data in the buffer comes out at the second speed.

The text-to-speech tables are good, but not infallible. In some cases you will want to send allophones directly to the chip to get exactly the right pronunciation, and the command for this is |FEED. To give you an idea of speech construction, the full table of allophones is provided plus a two-page dictionary. This has some really useful words, like bathe, cookie, sweats and threaders. Some of them aren't very good, either. DK suggest 16,7,7, 52,19,43 for 'memories'. This comes out like 'me-riss'. I played around and decided 16,7,7, 16,23,58,12,12,12,43 sounded much better.

Experiment a little: you'll find phonetic construction easy with a bit of practice.



THE AMSTRAD SSA1

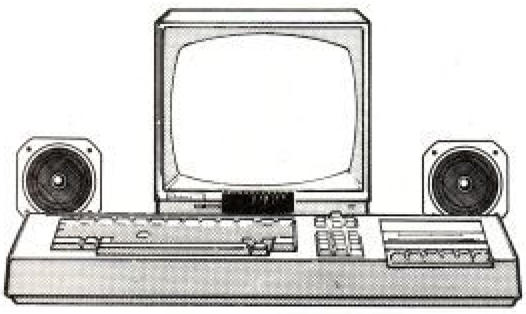
Amstrad's version comes in a box very similar to the floppy disc interface moulding, except that it's a couple of inches shorter. It plugged into my Arnor board without difficulty and drew a small enough current to allow operation with the disc drive connected.

Apart from that, things are much the same as on the DK'Tronics unit. The internal stereo sound is fed into the unit via a jack plug from the sound port, and the twin speakers, again of car hi-fi design, plug in at either side. A master volume control is fitted on the right hand side.

Again, only a single I/O address is required, but Finagle's Law dictates that Amstrad have chosen &FBEE while DK'Tronics use &FBFE. This might upset the software houses: if they write games with a speech option, the software has to muck about testing which port is in use and alter itself to suit. How about a bit more co-operation in future, guys?

As always, the documentation that accompanies the hardware is a superb production number. Twenty A4 pages tell you everything you ever wanted to know about speech synthesis.

Once again, control of the speech unit is made easier by a set of RSXs (completely relocatable) supplied on tape. It's perhaps surprising that neither company included the software



as external commands in a ROM, since that was the design philosophy behind peripheral handling on the Amstrad. DK'Tronics quoted lack of R & D time as the reason for their choice, while Amstrad said they did it to keep the price down. Fair enough, but once you've tasted instant software on ROM, anything else is a bit of a let-down.

Nevertheless, the RSXs total nine, and provide a pretty comprehensive selection. The software occupies just over a kilobyte, compared to the 4K needed by DK'Tronics, as the SSA1 uses a text-to-speech algorithm (set of rules) rather than tables. This means it gets fooled on some everyday words, even if you try to help it out by altering the spelling. For example, to take leave of our editor a suitable phrase might be 'Goodbye Simon', but this comes out as 'gooo-dbee simmon'. 'Guudbiii Seyemon' is better, but as with the previous unit, sometimes the only answer is direct allophone generation.

On the SSA1, this is done by |APHONE. Text-to-speech can be performed using embedded ' marks in PRINT statements, though the syntax here is |ECHO plus a mode number for all text, listings only etc. |SAY allows text-to-speech without the hassle of including the reverse quotes.

The way in which text is spoken is rather better on the SSA1, in that numbers are spoken as we would pronounce them and not as single digits. For example, if a listing is being spoken aloud, the SSA1 says 'ten' and 'twenty' for line numbers, whereas the DK unit says 'one zero' and 'two zero'.

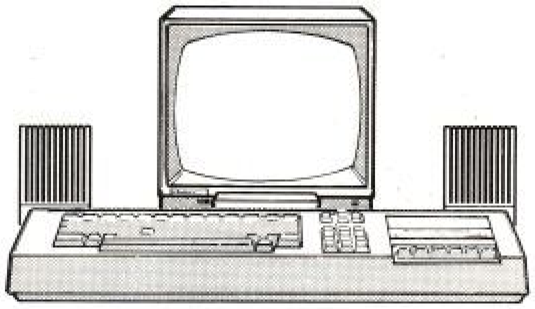
Again, |SPON and |SPOFF enable and disable the interrupt-driven processing of the allophone data in the speech buffer. |QUIET is the command to flush the buffers and silence the chip.

However, the Amstrad software also provides three extra commands for low level driving of the hardware. The first is |ROOM, which interrogates the system and tells you how many free locations there are in the allophone buffer, whether an allophone is being sounded, and whether the speech interrupts are active. |SPSTATUS is similar but only returns information about the hardware status of the chip itself. Finally |SPOUT is not a cue for the chip to talk incessantly, but sends allophones directly to the chip without passing through the buffer. You have to disable speech interrupts and control the handshaking yourself here.

There are a lot of useful demonstration programs included, such as a BASIC speaking clock which announces the time every five seconds, and tips on how programs should test for the presence of either the hardware or the SSA1 software.

CONCLUSIONS

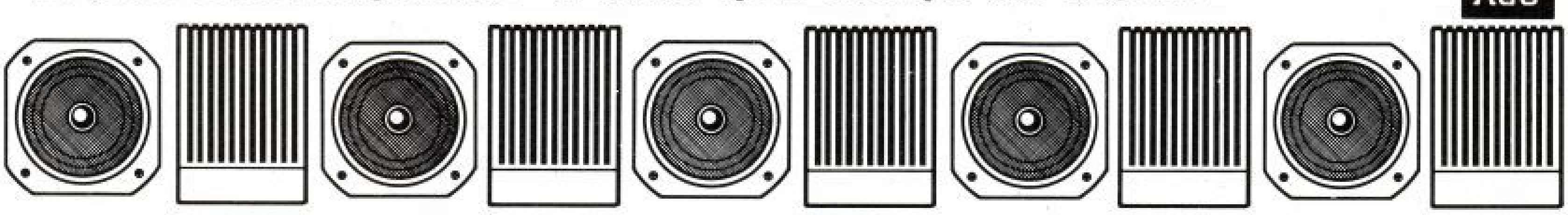
As far as features go, there isn't much to choose from between the units. The DK device has a better styling and appearance, and has a much bigger phonetic library. On the other hand, the SSA1 has more



commands and can provide a reasonably accurate text-to-speech conversion using less memory space, which could be critical on some of the largest commercial games.

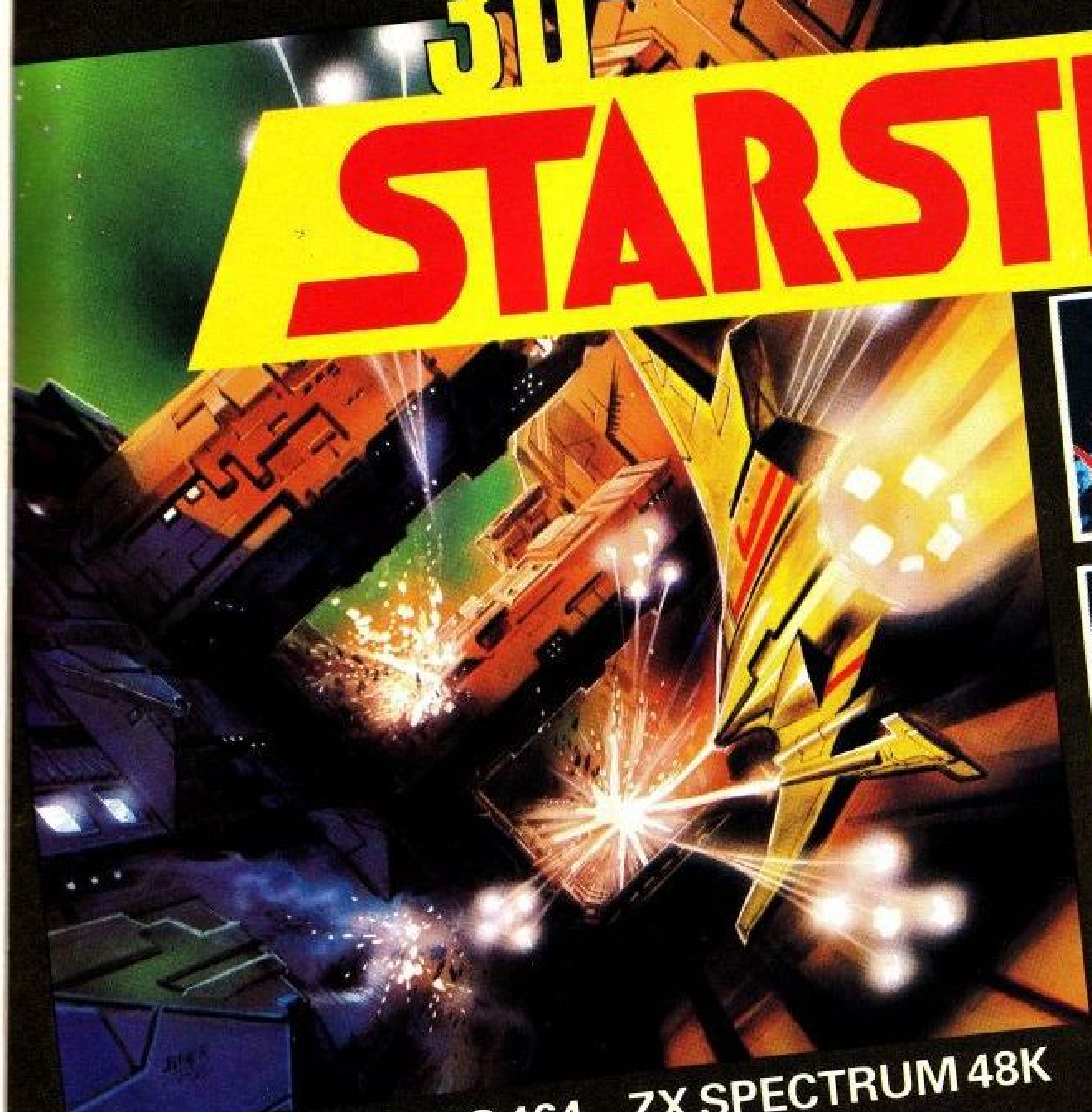
The actual sound of the speech has a different quality on the two systems, but it's difficult to put into words exactly what this difference is, or which you might prefer. I think it only fair to point out that the chip has to do a lot of approximating to enable such a complex thing as speech to be duplicated at all, so neither synthesizer sounds any better than your average Dalek.

I think it will be some time before we find blind people programming on the Amstrad and having their listings read back to them coherently: the main problem is that syllables are all given equal emphasis. It's surprising how difficult this can make comprehension. However, the units will allow an extra dimension to be given to games programs. ACU

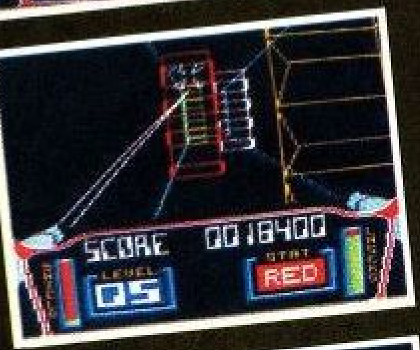


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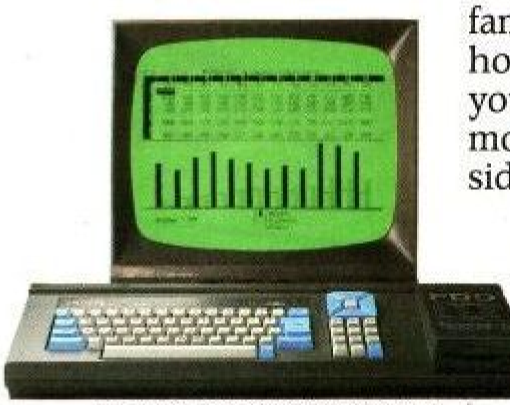
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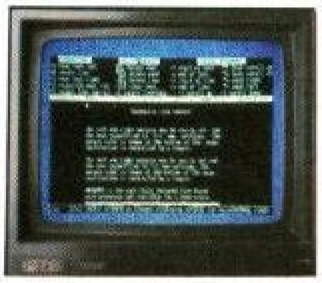


Amsoft Business Control, is a complete suite of programs for integrated sales invoicing, stock control and sales ledger for around £99. (Requires an additional FD-1 disc drive around £159 and DL-2 cable around £7).

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There are hundreds of programs for business or pleasure available on disc (and cassette) to CPC 664 users. Many from Amsoft, others from other famous-name software houses. Few will cost you more than £49 and most will cost you considerably less.

AN EXPANDING · SYSTEM ·

There is a complete range of peripherals available to CPC 664 users which plug directly into the built-in interfaces.

These include a joystick, additional disc drive (to double your on-line storage) and the Amstrad DMP-1 dot-matrix printer. (There's also a cassette interface so that you can use CPC 464 programs on tape). And there are many more peripherals from Amstrad and other manufacturers which can be used to enhance the CPC 664.

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Join the optional Amstrad User Club and we'll keep you informed with our monthly user magazine, and information on all software as it is introduced. Your membership details will be recorded on your personal club card, which entitles members to various privileges and offers.

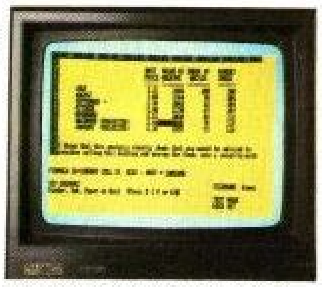
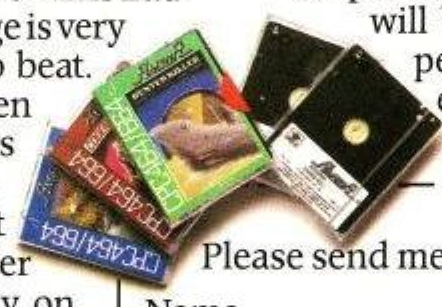


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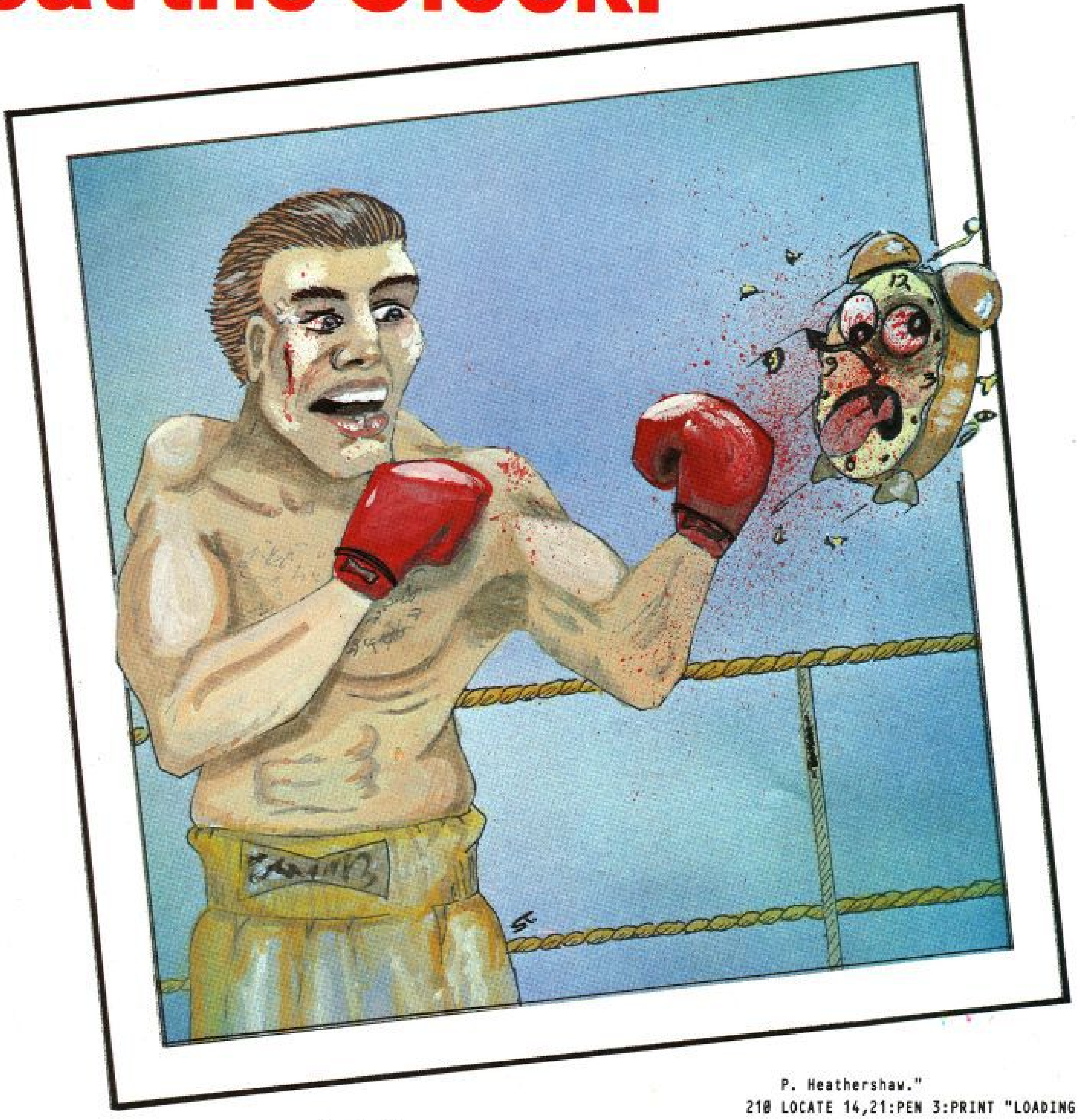
Amstrad CPC 664

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Beat the Clock.



As promised in an early edition of CPC464 User here is the listing of the prize-winning 'Beat the Clock' program.

The game is a cross between a word game and a race against time. You are given a set of letters and have to make as many words as possible within the given time. Full instructions are included in the program. The game turns the screen black whilst it sets some things up so don't be alarmed. It would be impossible for the program to know all the words in the English language, even if it did it would be a pain to have to type them all in to the program. This means that you have to be honest and only offer it valid words. No cheating now!

Loader Program.

Save this on the tape before the main program.

```
10 REM "AMSOFT" LOGO
20 DEFINT a-z:SPEED INK 40,10
30 title$="Beat the Clock"
40 INK 0,0:INK 1,24,0:INK 2,0:INK 3,0
50 PAPER 0:PEN 1:BORDER 0,0:MODE 1
60 LOCATE 15,21:PRINT "Please Wait..";
70 PLOT 160,290,2:GOSUB 230:RESTORE
80 PLOT 158,294,3:GOSUB 230
90 chars=LEN(title$):pixels=chars*8
100 x=(639-chars*32)/2
110 LOCATE 1,1:PEN 3:PRINT title$;:PEN 1
120 tx=x:y=220:y2=398
130 FOR f=1 TO 8:x2=0:FOR g=1 TO pixels
140  IF TEST(x2,y2)=3 THEN PLOT x,y,2:PL
   OT x,y-2:PLOT x+2,y:PLOT x+2,y-2
150  x=x+4:x2=x2+2
160 NEXT g:y=y-4:y2=y2-2:x=tx:NEXT f
170 LOCATE 1,1:PRINT SPACE$(chars)
180 INK 1,6,6:INK 2,2,2:INK 3,19,19
190 LOCATE 17,10:PRINT "PRESENTS";
200 LOCATE 9,16:PRINT " by
   P. Heathershaw."
210 LOCATE 14,21:PEN 3:PRINT "LOADING ..
   ....";
220 GOTO 560
230 READ t,x,y:IF t=0 THEN RETURN
240 IF t=1 THEN DRAWR x,y ELSE MOVER x,y
250 GOTO 230
260 REM "A"
270 DATA 1,-41,0,2,0,2,1,41,0,2,2,2,1,-4
   1,0,2,0,2,1,41,0,2,-3,2
280 DATA 1,34,70,2,2,0,1,-34,-70,2,2,0,1
   ,34,70,2,2,0,1,-34,-70,2,30,72
290 DATA 1,47,0,2,0,2,1,-47,0,2,2,2,1,47
   ,0,2,0,2,1,-47,0,2,37,-8
300 DATA 1,-34,-70,2,2,0,1,34,70,2,2,0,1
   ,-34,-70,2,2,0,1,34,70,2,-57,-38
310 DATA 1,32,0,2,0,2,1,-32,0,2,2,2,1,32
   ,0,2,0,2,1,-32,0,2,12,-46
320 REM "M"
330 DATA 1,30,0,2,0,2,1,-30,0,2,2,2,1,30
   ,0,2,0,2,1,-30,0,2,25,2
340 DATA 1,18,38,2,2,0,1,-18,-38,2,2,0,1
   ,18,38,2,2,0,1,-18,-38,2,12,24
350 DATA 1,0,-32,2,2,0,1,0,36,2,2,4,1,0,
   -40,2,2,0,1,0,44,2,2,-36
360 DATA 1,39,39,2,0,-2,1,-39,-39,2,0,-2
   ,1,37,37,2,0,-2,1,-37,-37,2,20,6
370 DATA 1,18,38,2,2,0,1,-18,-38,2,2,0,1
```

```
    ,18,38,2,2,0,1,-18,-38,2,-10,-8
380 REM "S"
390 DATA 1,57,0,2,0,2,1,-57,0,2,2,2,1,57
    ,0,2,0,2,1,-57,0,2,51,2
400 DATA 1,7,0,2,0,2,1,-7,0,2,2,2,1,7,0,
    2,0,2,1,-7,0,2,2,2,1,7,0,2,0,2,1,-7,
    0,2,9,2
410 DATA 1,-29,0,2,0,2,1,29,0,2,2,2,1,-2
    9,0,2,0,2,1,29,0,2,-27,2
420 DATA 1,7,0,2,0,2,1,-7,0,2,2,2,1,7,0,
    2,0,2,1,-7,0,2,2,2,1,7,0,2,0,2,1,-7,
    0,2,2,2
430 DATA 1,29,0,2,0,2,1,-29,0,2,2,2,1,29
    ,0,2,0,2,1,-29,0,2,46,-8
440 REM "O"
450 DATA 1,-15,-30,2,2,0,1,15,30,2,2,0,1
    ,-15,-30,2,2,0,1,15,30,2,-25,-38
460 DATA 1,29,0,2,0,2,1,-29,0,2,2,2,1,29
    ,0,2,0,2,1,-29,0,2,39,32
470 DATA 1,-15,-30,2,2,0,1,15,30,2,2,0,1
    ,-15,-30,2,2,0,1,15,30,2,-27,2
480 REM "F"
490 DATA 1,117,0,2,0,2,1,-117,0,2,2,2,1,
    117,0,2,0,2,1,-117,0,2,63,32
500 DATA 1,-39,-78,2,2,0,1,39,78,2,2,0,1
    ,-39,-78,2,2,0,1,39,78,2,-4,2
510 DATA 1,29,0,2,0,2,1,-29,0,2,2,2,1,29
    ,0,2,0,2,1,-29,0,2,46,0
520 REM "T"
530 DATA 1,-39,-78,2,2,0,1,39,78,2,2,0,1
    ,-39,-78,2,2,0,1,39,78,2,-49,-86
540 DATA 1,69,0,2,0,2,1,-69,0,2,2,2,1,69
    ,0,2,0,2,1,-69,0
550 DATA 0,0,0
560 RUN "!clock2.lis"
```

This is the main program. Type it in and SAVE '!clock2.lis'

```
10 GOTO 160
20 IF clk=366 THEN RETURN
30 ORIGIN 450,130
40 ocx1=SIN(clk-20)*20:ocy1=COS(clk-20)*
   20
50 ocx2=SIN(clk)*50:ocy2=COS(clk)*50
60 ocx3=SIN(clk+20)*20:ocy3=COS(clk+20)*
   20
70 CALL &BD19
80 DRAW cx1,cy1,2:DRAW cx2,cy2:DRAW cx3,
   cy3:DRAW 0,0
90 DRAW ocx1,ocy1,1:DRAW ocx2,ocy2:DRAW
   ocx3,ocy3:DRAW 0,0
100 IF tk=1 THEN tk=0:SOUND 4,100,1,7,,2
     ELSE tk=1:SOUND 4,70,1,7,,,2
110 cx1=ocx1:cy1=ocy1:cx2=ocx2:cy2=ocy2:
    cx3=ocx3:cy3=ocy3
120 clk=clk+6
130 PLOT 600,400,2
140 ORIGIN ox,oy
150 RETURN
160 DEG:MODE 1:INK 0,0:PAPER 0:INK 1,0:I
    NK 2,0:INK 3,0:PEN 1:BORDER 0
170 DEFINT A-Z
180 ORIGIN 0,0
190 TAG:PLOT 400,600,2
200 PLOT 200,397:PRINT"BEAT the CLOCK";
210 MOVE 200,381:PRINT STRING$(14,208);
220 TAGOFF
230 PRINT:PRINT:PRINT:PRINT" A game of s
    kill and fun for all the   "CHR$(10)
    "family. 1 to 6 players with progres
    sing"CHR$(10)"difficulty as the game
     proceeds."
240 PRINT:PRINT" Design a crossword usin
    g the 13 random"CHR$(10)" letters, b
    ut";:PEN 3:PRINT"HURRY";:PEN 1:PRINT
    ", your time is running"CHR$(10)"out
    ."
241 STOP
250 ORIGIN 320,86
260 GOSUB 460
270 ORIGIN 0,0
280 FOR i=18 TO 170 STEP 4
290 MOVE 0,i:DRAW 240,i,2
300 FOR j=2 TO 40 STEP 2:IF TEST(250+j,i
    )<>0 THEN 320
310 PLOT 240+j,i,2:NEXT
320 NEXT
330 FOR i=18 TO 170 STEP 4
340 MOVE 639,i:DRAW 420,i,1
350 FOR j=418 TO 380 STEP -2:IF TEST(j-1
    0,i)<>0 THEN 370
360 PLOT j,i,1:NEXT
370 NEXT
380 MOVE 0,174:DRAW 639,174,3
390 MOVE 0,0:DRAW 0,399:DRAW 639,399:DRA
    W 639,0:DRAW 0,0
400 INK 1,0:INK 2,26:INK 3,13:INK 0,14:B
    ORDER 14
410 ox=320:oy=86
420 ORIGIN 320,86
430 MOVE 0,0
440 ' FOR i=1  TO 61:GOSUB 40:FOR dd=1 T
    O 100:NEXT:NEXT
450 GOTO 810
460 FOR I=0 TO 8:MOVE -(40+I),-(56-I)
470 DRAW -(50+I),-66,2:NEXT
480 MOVE -38,54:FOR i=0 TO 6 STEP 2:DRAW
     -(38+i),64,2:MOVE -(40+i),54:NEXT
490 FOR I=1 TO 180 STEP 2
500 X=SIN(I)*66:Y=COS(I)*66
510 PLOT X,Y,14
520 DRAWR 20,0,1:PLOTR 2,0,2:MOVE X,Y
530 X=SIN(-I)*66:Y=COS(-I)*66
540 DRAW X,Y,2:PLOTR -2,0,1
550 NEXT
560 PLOT -64,22,1:PLOTR 2,0:DRAWR 126,0,
    2:DRAWR 18,0,1:PLOTR 2,0,2
570 PLOT -68,4,1:PLOTR 2,0: DRAWR 134,0,
    2:DRAWR 18,0,1:PLOTR 2,0,2
580 PLOT -68,-4,1:PLOTR 2,0:DRAWR 134,0,
    2:DRAWR 18,0,1:PLOTR 2,0,2
590 PLOT -64,-22,1:PLOTR 2,0:DRAWR 126,0
    ,2:DRAWR 18,0,1:PLOTR 2,0,2
600 FOR I=0 TO 8
610 MOVE 46+I,-56+I
620 DRAW 56+I,-66,2
630 NEXT
640 FOR i=0 TO 360 STEP 30
650 x=SIN(i)*54:y=COS(i)*54
660 PLOT x,y,1
670 x=SIN(i)*62:y=COS(i)*62
680 DRAW x,y
690 NEXT
700 MOVE 45,54
710 FOR i=0 TO 6 STEP 2:DRAW 45+i,64,2:M
    OVE 47+i,54:NEXT
720 FOR i=1 TO 180 STEP 8
730 x=SIN(i)*10:y=COS(i)*10
740 MOVE 42,74:PLOTR x,y:DRAWR 6,0
750 x=SIN(i+180)*10:y=COS(i+180)*10
760 MOVE -38,74:PLOTR x,y:DRAWR -6,0
770 NEXT
780 FOR i=0 TO 4
790 MOVE 46,80+i:DRAWR -88,0:NEXT
800 RETURN
810 GOTO 960
820 IF clk=366 THEN RETURN
830 ORIGIN 450,130
840 ocx1=SIN(clk-20)*20:ocy1=COS(clk-20)
    *20
850 ocx2=SIN(clk)*50:ocy2=COS(clk)*50
860 ocx3=SIN(clk+20)*20:ocy3=COS(clk+20)
    *20
870 CALL &BD19
880 DRAW cx1,cy1,2:DRAW cx2,cy2:DRAW cx3
    ,cy3:DRAW 0,0
890 DRAW ocx1,ocy1,1:DRAW ocx2,ocy2:DRAW
    ocx3,ocy3:DRAW 0,0
900 IF tk=1 THEN tk=0:SOUND 4,100,1,7,,2
     ELSE tk=1:SOUND 4,70,1,7,,,2
910 cx1=ocx1:cy1=ocy1:cx2=ocx2:cy2=ocy2:
    cx3=ocx3:cy3=ocy3
920 clk=clk+6
930 PLOT 600,400,2
940 ORIGIN ox,oy
950 RETURN
960 DEFINT a-z
970 DEFREAL C,O
980 EVERY 50,2 GOSUB 840
990 ox=320:oy=86
1000 ORIGIN 320,86
1010 MOVE 0,0
1020 PAPER 1:LOCATE 15,25:PRINT"
           ":PAPER 0
1030 'FOR i=1  TO 61:GOSUB 40:FOR dd=1 T
     O 100:NEXT:NEXT
1040 LOCATE 2,20:PRINT CHR$(22);"1";:PEN
      3:PRINT"I=instructions
     S=start";CHR$(22);"0"
1050 INK 3,20,10
1060 a$=INKEY$:IF a$="" THEN 1060
1065 IF a$="s" OR a$="S" THEN SOUND 1,20
     ,20,7:GOTO 1090
1070 IF a$="i" OR a$="I" THEN SOUND 1,20
     ,20,7:GOTO 5100
1080 GOTO 1060
1090 BORDER 0:INK 3,25:WINDOW 1,40,1,14:
     PAPER 1:CLS:PAPER 0
1100 DI:ORIGIN 0,0:FOR i=78 TO 100 STEP
     4:MOVE 10,i:DRAW 240,i,2:MOVE 10,i+
     2:DRAW 240,i+2,0:MOVE 420,i:DRAW 60
     0,i,1:MOVE 420,i+2:DRAW 600,i+2,0:N
     EXT:ORIGIN 320,86:EI
1110 LOCATE 1,1:PAPER 1:PEN 2:PRINT TAB(
     13);"BEAT the CLOCK":PRINT TAB(13);
     STRING$(14,208)
1120 PRINT:PRINT" Number of players 1 to
      6  ";
1130 a$=INKEY$:IF a$="" THEN 1130
1135 IF a$="." THEN 1130
1140 npl=VAL(a$):IF npl<1 OR npl>6 THEN
     1130
1150 PRINT a$
1160 LOCATE 1,5
1170 FOR i=5 TO 6-npl STEP -1
1180 LOCATE 1,5+(5-i):PRINT"Player ";6-i
     ;
1190 '
1200 a$=INKEY$: IF a$="" THEN 1200
1210 IF a$=CHR$(127) THEN 1270
1220 IF a$=CHR$(13) THEN 1300
1230 a$=LOWER$(a$)
1240 pl$(i)=pl$(i)+a$
1250 PRINT a$;
1260 GOTO 1290
1270 PRINT CHR$(8)" ";CHR$(8);
1280 pl$(i)=LEFT$(pl$(i),LEN(pl$(i))-1)
1290 GOTO 1190
1300 NEXT
1310 PRINT:PRINT" Target score (500 Max.
     ) ";
1320 DL=0:FR=0:GOSUB  1350:A=VAL(A$):IF
     A>5 THEN 1320 ELSE  PRINT A$;:FR=1
1330 DL=0:GOSUB  1350:IF DL=1 THEN 1320
     ELSE B=VAL(A$):PRINT A$;
1340 GOSUB  1350:IF DL=1 THEN 1330 ELSE
     C=VAL(A$):PRINT A$;
1343 A$=INKEY$:IF A$="" THEN 1343
1345  IF A$=CHR$(13) THEN 1353
1346 IF A$=CHR$(127) THEN PRINT CHR$(8)"
      ";CHR$(8);:GOTO 1340
1347 GOTO 1343
1350 A$=INKEY$:IF A$="" THEN 1350
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1351 IF A$=CHR$(127) AND FR>0  THEN PRIN
     Tchr$(8)" ";CHR$(8);:DL=1:RETURN
1352 IF ASC(A$)<48 OR ASC(A$)>57 THEN 13
     50 ELSE RETURN
1353 TRG=A*100+B*10+C
1354 IF TRG>500 THEN PRINT CHR$(8);CHR$(
     8);CHR$(8);"     ";CHR$(8);CHR$(8);C
     HR$(8);CHR$(8);:GOTO 1320
1360 EVERY 50,2 GOSUB 5020
1370 MODE 1:INK 0,0:INK 1,0:INK 2,0:INK
     3,0
1380 DATA HNETRO,ADJENR,VUOCNR,IRDETS,WA
     EDVT,PMGUIE,YOPUMW,SAXBEY,GAIFLQ,HA
     TESL,OSBUMN,ZECFAI,ELORTI
1390 DATA 321221,136122,431422,223122,41
     1342,434321,414334,218414,412428,31
     2122,124332,914412,121222
1400 DATA 1,4,4,3,1,4,4,3,2,6,5,2,3,2,1,
     4,8,2,2,2,3,4,4,8,4,9
1410 ENV 1,1,15,15,15,-1,3
1420 ENT 1,0,0,25,12,-1,2
1430 DIM L$(13),V$(13),G$(14,14),V(26)
1440 FOR I=0 TO 14:FOR J=0 TO 12:G$(I,J)
     =" ":NEXT:NEXT
1450 PAPER 0:PEN 1
1460 FOR I=1 TO 13:READ L$(I):NEXT
1470 FOR I=1 TO 13:READ V$(I):NEXT
1480 FOR I=1 TO 26:READ V(I):NEXT
1490 PRINT"  BEAT THE CLOCK       ";:PEN
     2:PRINT"Players      Score":PEN 1

1500 DEG:pl=5
1510 TIM=100
1520 GOSUB 3810
1530 GOSUB 3710
1540 GOSUB 3340
1550 GOSUB 3220
1560 EVERY 0,2 GOSUB 5020
1570 INK 0,14:SOUND 1,20,50,0,1:FOR I=1
     TO 1000:NEXT
1580 INK 1,0:SOUND 1,20,50,0,1:FOR I=1 T
     O 1000:NEXT
1590 INK 2,26:SOUND 1,20,50,0,1:FOR I=1
     TO 1000:NEXT
1600 INK 3,13:SOUND 1,20,50,0,1:FOR I=1
     TO 1000:NEXT
1610 BORDER 14:SOUND 1,20,50,0,1:FOR I=1
     TO 1000:NEXT
1620 TAG:PLOT 600,400,2:MOVE 32,100:PRIN
     T UPPER$(pl$(5));
1630 CLK=0:GOSUB 820
1640 TAGOFF:LOCATE 1,20:PEN 1:PRINT" SPA
     CEBAR to PLAY":PEN 2
1650 IF INKEY$<>" " THEN 1650
1660 LOCATE 1,20:PRINT"
     ":TAG
1670 GOSUB 3060
1680 clk=0:ORIGIN 108,28:ox=108:oy=28
1690 TAGOFF
1700 EVERY TIM,1 GOSUB 820
1710 s$="":pp=0
1720 ORIGIN 108,28:ox=108:oy=28
1730 PEN 1
1740 LOCATE 1,20:PRINT" ENTER":PRINT" WO
     RD->"
1750 PEN 2
1760 A$=INKEY$:IF clk=366 THEN 3930 ELSE
      IF A$="" THEN 1760
1770 IF A$="a" THEN CLK=360:GOTO 1760
1780 IF a$=" " THEN LOCATE pp+8,21:PRINT
     "£":pp=pp+1:s$=s$+" ":GOTO 1760
1790 IF a$=CHR$(16) AND s$="" THEN GOSUB
      2840:GOTO 1720
1800 IF A$=CHR$(13) AND S$>"" THEN SOUND
      1,40,30,7:GOTO 2120
1810 IF A$=CHR$(127) AND pp>0 THEN GOSUB
      1980:SOUND 1,400,20,7:GOTO 1760
1820 A$=UPPER$(A$)
1830 IF ASC(A$)<65 OR ASC(A$)>90 THEN 17
     60
1840 IF INSTR(WL$,A$)=0 THEN 1760
1850 LOCATE 8+PP,21:PRINT A$
1860 s$=s$+a$
1870 pp=pp+1
1880 p=INSTR(wl$,a$)
1890 MID$(wl$,p,1)=" "
1900 DI
1910 PLOT 600,400,1
1920 SOUND 1,40,30,0,1
1930 TAG:MOVE p*38,0:PRINT a$;
1940 MOVE p*38,26:PRINT MID$(v$,p,1);
1950 TAGOFF
1960 EI
1970 GOTO 1760
1980 TAGOFF:pp=pp-1:LOCATE pp+8,21:PRINT
     " ":LOCATE pp+8,21
1990 a$=RIGHT$(s$,1)
2000 FOR i=1 TO 13
2010 IF MID$(w$,i,1)=a$ AND MID$(wl$,i,1
     )=" " THEN MID$(wl$,i,1)=a$:GOTO 20
     30
2020 NEXT
2030 PLOT 600,400,2
2040 DI
2050 TAG
2060 MOVE i*38,0:PRINT a$;
2070 MOVE i*38,26:PRINT MID$(v$,i,1);
2080 s$=MID$(s$,1,LEN(s$)-1)
2090 TAGOFF
2100 EI
2110 RETURN
2120 '
2130 x=0:y=0
2140 PEN 1
2150 LOCATE 1,20:PEN 1:PRINT"POSITION":P
     RINT"CURSOR"
2160 IF SBCL=1 THEN LOCATE 10,20:PEN 2:P
     RINT"D";:PEN 1:PRINT"=DELETE":LOCAT
     E 10,21:PEN 2:PRINT"a";:PEN 1:PRINT
     "=EXIT"
2170 ORIGIN 16,128
2180 ox=16:oy=128
2190 PLOT 600,400,2
2200 TAG
2210 DI:MOVE X*22,Y*22
2220 IF CH=1 THEN CH=0:PRINT G$(X+1,Y+1)
     ; ELSE CH=1:PRINT CHR$(233);
2230 EI
2240 '
2250 FOR I=1 TO 40
2260 A$=INKEY$
2270 IF A$<>"" THEN 2310
2280 IF clk=366 AND ch=0 THEN 3930
2290 NEXT
2300 GOTO 2210
2310 SOUND 1,300,2,5:DI:MOVE X*22,Y*22:P
     RINT G$(X+1,Y+1);:EI
2320 IF A$=CHR$(13) AND sbcl=0 THEN SOUN
     D 1,20,7:GOTO 2400
2330 IF (A$="D" OR A$="d") AND sbcl=1 TH
     EN SOUND 1,100,20,7:RETURN
2340 IF a$="a" AND sbcl=1 THEN RETURN
2350 IF A$=CHR$(243) THEN X=X+1:IF X>11
     THEN X=0:GOTO 2210
2360 IF A$=CHR$(242) THEN X=X-1:IF X<0 T
     HEN X=11:GOTO 2210
2370 IF A$=CHR$(241) THEN Y=Y-1:IF Y<0 T
     HEN Y=11:GOTO 2210
2380 IF A$=CHR$(240) THEN Y=Y+1:IF Y>11
     THEN Y=0:GOTO 2210
2390 GOTO 2210
2400 TAGOFF:LOCATE 1,20:PEN 2:PRINT"A";:
     PEN 1:PRINT"cross  "
2410 PEN 2:PRINT"D":PEN 1:PRINT"own  "
2420 a$=INKEY$
2430 IF clk=366 THEN 3930
2440 a$=UPPER$(a$)
2450 IF a$<>"A" AND a$<>"D" THEN 2420
2460 SOUND 1,30,20,7
2470 x1=x+1:y1=y+1:ok=0
2480 FOR i=1 TO LEN(s$)
2490 IF MID$(s$,i,1)=" " AND g$(x1,y1)="
     " THEN GOTO 2600
2500 IF MID$(s$,i,1)<>" " AND g$(x1,y1)<
     >" " THEN GOTO 2600
2510 IF a$="A" THEN IF g$(x1,y1-1)<>" "
     OR g$(x1,y1+1)<>" " THEN ok=1
2520 IF a$="D" THEN IF g$(x1-1,y1)<>" "
     OR g$(x1+1,y1)<>" " THEN ok=1
2530 IF a$="A" THEN x1=x1+1:IF x1>13 THE
     N 2600
2540 IF a$="D" THEN y1=y1-1:IF y1<0 THEN
      2600
2550 NEXT
2560 IF A$="A" THEN IF G$(X,Y+1)<>" " OR
      G$(X+LEN(S$)+1,Y+1)<>" " THEN OK=1
2570 IF A$="D" THEN IF G$(X+1,Y+2)<>" "
     OR G$(X+1,Y-(LEN(S$)-1))<>" " THEN
     OK=1
2580 IF ok=1 THEN 2680
2590 IF ok=0 AND ft=0 THEN 2680
2600 '
2610 l=LEN(s$)
2620 FOR d=1 TO L
2630 TAGOFF:ORIGIN 108,28
2640 ox=108:oy=28
2650 GOSUB 1980
2660 NEXT
2670 GOTO 1690
2680 PLOT 600,400,2
2690 TAG
2700 DI
2710 x1=x+1:y1=y+1
2720 FOR i=1 TO LEN(s$)
2730 IF MID$(s$,i,1)=" " THEN 2760
2740 MOVE x*22,y*22:PRINT MID$(s$,i,1);
2750 g$(x+1,y+1)=MID$(s$,i,1)
2760 IF a$="A" THEN x=x+1 ELSE y=y-1
2770 NEXT
2780 EI
2790 TAGOFF:LOCATE 8,21:PRINT"
     "
2800 ft=1
2810 ORIGIN 108,28
2820 ox=108:oy=28
2830 GOTO 1710
2840 '
2850 DI:PLOT 600,400,2:TAGOFF
2860 sbcl=1:GOSUB 2150:sbcl=0
2870 IF a$="a" THEN 3010
2880 TAG
2890 IF g$(x+1,y+1)=" " THEN 2850
2900 MOVE x*22,y*22:PRINT" ";
2910 ORIGIN 108,28
2920 FOR i=1 TO 13
2930 IF MID$(w$,i,1)=g$(x+1,y+1) AND MID
     $(wl$,i,1)=" " THEN 2950
2940 NEXT
2950 MID$(wl$,i,1)=g$(x+1,y+1)
2960 MOVE i*38,0:PRINT g$(x+1,y+1);
2970 MOVE i*38,26:PRINT MID$(v$,i,1);
2980 g$(x+1,y+1)=" "
2990 TAGOFF
3000 GOTO 2860
3010 TAGOFF
3020 LOCATE 1,20:PRINT"
     "
3030 PRINT"                "
3040 EI
3050 RETURN
3060 ORIGIN 108,28
3070 ox=108:oy=28
3080 W$="":WL$="":v$=""
3090 FOR I=1 TO 13
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3100 FOR J=1 TO RND*10+6
3110 L=L+1:IF L>6 THEN L=1
3120 MOVE I*38,0:PRINT MID$(L$(I),L,1);
3130 SOUND 1,50,5,5:SOUND 1,50,3,0
3140 NEXT
3150 w$=w$+MID$(l$(i),l,1)
3160 MOVE I*38,26:PRINT MID$(V$(I),L,1);
3170 v$=v$+MID$(v$(i),l,1)
3180 SOUND 2,25,50,0,1
3190 NEXT
3200 WL$=W$
3210 RETURN
3220 TAG:ORIGIN 320,280,0,639,400,0
3230 PLOT 600,400,2
3240 FOR i=10 TO 12-npl*2 STEP -2
3250 MOVE 0,i*10
3260 PRINT ABS(i/2-6);"           ";:MOVE
     230,i*10:PRINT"      ";
3270 MOVE 0,i*10+2:DRAWR 208,0,1:DRAWR 0
     ,-18:DRAWR-208,0:DRAWR 0,18:MOVE 22
     8,i*10+2:DRAWR 82,0:DRAWR 0,-18:DRA
     WR -82,0:DRAWR 0,18:PLOT 600,400,2
3280 PLOT 600,400,1:MOVE 32,i*10:PRINT p
     l$(i/2);:PLOT 600,400,2
3290 NEXT
3300 MOVE 10,i*10-6:PRINT"TARGET SCORE
     ";TRG;
3310 l=LEN(STR$(trg))
3320 MOVE 8,i*10-4:DRAWR 242+l*16,0,1:DR
     AWR 0,-18:DRAWR -(242+l*16),0:DRAWR
     0,18
3330 RETURN
3340 '
3350 ORIGIN 450,130,0,639,0,399
3360 FOR I=0 TO 8:MOVE -(40+I),-(56-I)
3370 DRAW -(50+I),-66,2:NEXT
3380 MOVE -38,54:FOR i=0 TO 6 STEP 2:DRA
     W -(38+i),64,2:MOVE -(40+i),54:NEXT
3390 FOR I=1 TO 180 STEP 2
3400 X=SIN(I)*66:Y=COS(I)*66
3410 PLOT X,Y,14
3420 DRAWR 20,0,1:PLOTR 2,0,2:MOVE X,Y
3430 X=SIN(-I)*66:Y=COS(-I)*66
3440 DRAW X,Y,2:PLOTR -2,0,1
3450 NEXT
3460 PLOT -64,22,1:PLOTR 2,0:DRAWR 126,0
     ,2:DRAWR 18,0,1:PLOTR 2,0,2
3470 PLOT -68,4,1:PLOTR 2,0: DRAWR 134,0
     ,2:DRAWR 18,0,1:PLOTR 2,0,2
3480 PLOT -68,-4,1:PLOTR 2,0:DRAWR 134,0
     ,2:DRAWR 18,0,1:PLOTR 2,0,2
3490 PLOT -64,-22,1:PLOTR 2,0:DRAWR 126,
     0,2:DRAWR 18,0,1:PLOTR 2,0,2
3500 FOR I=0 TO 8
3510 MOVE 46+I,-56+I
3520 DRAW 56+I,-66,2
3530 NEXT
3540 FOR i=0 TO 360 STEP 30
3550 x=SIN(i)*54:y=COS(i)*54
3560 PLOT x,y,1
3570 x=SIN(i)*62:y=COS(i)*62
3580 DRAW x,y
3590 NEXT
3600 MOVE 45,54
3610 FOR i=0 TO 6 STEP 2:DRAW 45+i,64,2:
     MOVE 47+i,54:NEXT
3620 FOR i=1 TO 180 STEP 8
3630 x=SIN(i)*10:y=COS(i)*10
3640 MOVE 42,74:PLOTR x,y:DRAWR 6,0
3650 x=SIN(i+180)*10:y=COS(i+180)*10
3660 MOVE -38,74:PLOTR x,y:DRAWR -6,0
3670 NEXT
3680 FOR i=0 TO 4
3690 MOVE 46,80+i:DRAWR -88,0:NEXT
3700 RETURN
3710 ORIGIN 9,10,9,630,62,10
3720 CLG 3
3730 DRAWR 0,52,1:DRAWR 620,0:DRAWR 0,-5
     2:DRAWR -620,0
3740 MOVE 0,26:DRAWR 620,0:MOVE 126,0:DR
     AWR 0,52
3750 PLOT 600,400,2:TAG:MOVE 4,18:PRINT"
     Letters";
3760 MOVE 4,44:PRINT"Values";
3770 FOR i=1 TO 13
3780 MOVE 126+i*38,0:DRAWR 0,52,1
3790 NEXT
3800 RETURN
3810 ORIGIN 12,110,9,272,376,110
3820 CLG 3
3830 gs=264
3840 FOR i=0 TO gs STEP 22
3850 MOVE 0,i:DRAW gs,i,1
3860 MOVE i,0:DRAW i,gs
3870 NEXT
3880 RETURN
3890 PRINT INT(RND*6)+1
3900 GOTO 3890
3910 A$=INKEY$:IF A$="" THEN 3910
3920 PRINT ASC(A$)
3930 '
3940 SBCL=0
3950 TAGOFF
3960 ENT -2,10,1,1,20,-1,1,10,1,1
3970 FOR i=1 TO 50:SOUND 1,30,2,7:SOUND
     1,20,2,7:NEXT
3980 FOR i=1 TO 35
3990 SOUND 1,30,1+i/3,0,1:SOUND 1,20,1+i
     /3,0,1
4000 s=s+0.2:i=i+s
4010 NEXT
4020 ENV 2,15,1,1,15,-1,20
4030 SOUND 2,20,20,7
4040 SOUND 1,20,300,0,2
4050 WHILE SQ(1)>127:WEND
4060 LOCATE 1,20:PEN 1:PRINT"CHALLANGE
          ":PEN 2:PRINT"  Y/N ?
     "
4070 WHILE INKEY$>"":WEND
4080 A$=INKEY$:IF a$="" THEN 4080
4090 a$=UPPER$(a$)
4100 IF a$="Y" THEN 5040
4110 IF a$<>"N" THEN 4080
4120 LOCATE 1,20:PEN 1:PRINT"       POINT
     S  ":PEN 2:PRINT"          "
4130 FOR I=1 TO 12
4140 FOR J=1 TO 12
4150 IF G$(J,I)>" " AND (G$(J-1,I)>" " O
     R G$(J+1,I)>" ") THEN PT=PT+V(ASC(G
     $(J,I))-64):LOCATE 8,21:PRINT PT:SO
     UND 1,50,30,0,1:WHILE SQ(1)>127:WEN
     D ELSE SOUND 1,20,1,5
4160 FOR D=1 TO 40:NEXT
4170 NEXT:NEXT
4180 FOR I=1 TO 12
4190 FOR J=1 TO 12
4200 IF G$(I,J)>" " AND (G$(I,J-1)>" " O
     R G$(I,J+1)>" ") THEN PT=PT+V(ASC(G
     $(I,J))-64):LOCATE 8,21:PRINT PT:SO
     UND 1,50,30,0,1:WHILE SQ(1)>127:WEN
     D ELSE SOUND 2,20,1,5
4210 FOR D=1 TO 40:NEXT
4220 NEXT:NEXT
4230 ORIGIN 320,280
4240 TAG
4250 FOR i=1 TO pt
4260 SOUND 1,500-PT(PL),3,7
4270 pt(pl)=pt(pl)+1
4280 MOVE (294-LEN(STR$(pt(pl)))*16),(pl
     *2)*10
4290 PRINT pt(pl);
4300 IF pt(pl)>trg THEN 5320
4310 NEXT
4320 MP=0
4330 ORIGIN 108,28
4340 IF s$="" THEN 4390
4350 FOR l=1 TO LEN(s$)
4360 GOSUB 1980
4370 SOUND 1,20,4,7
4380 NEXT
4390 FOR I=1 TO 13
4400 IF MID$(WL$,I,1)=" " THEN 4420
4410 MP=MP+V(ASC(MID$(WL$,I,1))-64)
4420 NEXT
4430 TAGOFF
4440 LOCATE 1,20:PRINT"                ":
     PRINT"             "
4450 IF MP>0 THEN 4710
4680 ORIGIN 108,28
4690 TAGOFF:LOCATE 8,20:PRINT"       "
4700 GOTO 4800
4710 ORIGIN 320,280:TAG:PLOT 600,400,2
4720 FOR i=1 TO mp
4730 pt(pl)=pt(pl)-1
4740 IF pt(pl)<0 THEN pt(pl)=0
4750 MOVE (288-LEN(STR$(pt(pl)))*16),(pl
     *2)*10
4760 PRINT pt(pl);
4770 SOUND 1,100+i*3,3,7
4780 NEXT
4790 ORIGIN 108,28
4800 TAG
4810 FOR i=1 TO 13
4820 TAG
4830 MOVE i*38,0:PRINT " ";:MOVE i*38,26
     :PRINT" ";
4840 SOUND 1,i*10,1,7
4850 NEXT
4860 ORIGIN 16,128
4870 FOR i=0 TO 11:FOR j=0 TO 11:IF g$(i
     +1,j+1)>" " THEN g$(i+1,j+1)=" ":MO
     VE i*22,j*22:PRINT" ";
4880 NEXT:NEXT
4890 ORIGIN 320,280
4900 PLOT 600,400,1:MOVE 32,(pl*2)*10:PR
     INT LOWER$(pl$(pl));
4910 pl=pl-1:IF pl<6-npl THEN pl=5:TIM=T
     IM-5:IF TIM<20 THEN TIM=20
4920 PLOT 600,400,2:MOVE 32,(pl*2)*10:PR
     INT UPPER$(pl$(pl));
4930 ft=0:pt=0
4940 TAGOFF
4950 LOCATE 1,20:PEN 1:PRINT" SPACEBAR t
     o PLAY":PEN 2
4960 IF INKEY$<>" " THEN 4960
4970 LOCATE 1,20:PRINT"
     "
4980 TAG
4990 GOTO 1670
5000 EVERY 30,1 GOSUB 5020
5010 GOTO 5010
5020 IF tk=1 THEN tk=0:SOUND 4,100,1,7,,
     2 ELSE tk=1:SOUND 4,70,1,7,,,2
5030 RETURN
5040 '
5050 LOCATE 1,20:PRINT"              "
5060 LOCATE 1,21:PRINT"              "
5070 EVERY 10000,1 GOSUB 820:clk=0
5080 sbcl=1:GOSUB 2840:sbcl=0
5090 GOTO 4120
5100 '
5110 BORDER 0:INK 3,25:WINDOW 1,40,1,14:
     PAPER 1:CLS:PAPER 0
5120 DI:ORIGIN 0,0:FOR i=78 TO 100 STEP
     4:MOVE 10,i:DRAW 240,i,2:MOVE 10,i+
     2:DRAW 240,i+2,0:MOVE 420,i:DRAW 60
     0,i,1:MOVE 420,i+2:DRAW 600,i+2,0:N
     EXT:ORIGIN 320,86:EI
5130 PAPER 1
5140 PRINT TAB(13);"BEAT the CLOCK"
5150 PRINT TAB(13);STRING$(14,208)
5160 PRINT:PRINT" The object of  the  ga
     me  is  to make a":PRINT"crossword
      using   13   random  letters,":PRI
```

```
     NT"obeying normal crossword rules b
     ut there"
5170 PRINT"is a time limit which gets sh
     orter after":PRINT"each round.
                                       ":
     PEN 3:PRINT" SPACEBAR TO CONTINUE":
     PEN 2
5180 IF INKEY$<>" " THEN 5180
5190 CLS:PRINT TAB(13);"BEAT the CLOCK":
     PRINT TAB(13);STRING$(14,208)
5200 PRINT:PRINT" Enter a word from the
     letters available":PRINT"and press
     ENTER, then postion the cursor":PRI
     NT"using the arrow keys to where  t
     he  word":PRINT"is to start on the
     grid.    Press  ENTER":PRINT"then '
     A' for across or 'D' for down."
5210 PRINT:PRINT"             SPACEBAR TO C
     ONTINUE"
5220 IF INKEY$<>" " THEN 5220
5230 CLS:PRINT TAB(13);"BEAT the CLOCK":
     PRINT TAB(13);STRING$(14,208)
5240 PRINT:PRINT"  If a word is to  cros
     s a  word in  the":PRINT"grid then
     that word must  have  a  space":PRI
     NT"where they cross. Words may  be
      deleted":PRINT"from the grid by pr
     essing the 'CLR' key."
5250 PRINT:PRINT:PRINT"            SPACEBA
     R TO CONTINUE"
5260 IF INKEY$<>" " THEN 5260
5270 CLS:PRINT TAB(13);"BEAT the CLOCK":
     PRINT TAB(13);STRING$(14,208)
5280 PRINT:PRINT" When the players time
     is  up  then  the":PRINT"next playe
     r may challenge one or more of":PRI
     NT"the words in the grid  and  remo
     ve  then":PRINT"before the points a
     re added up."
5290 PRINT:PRINT:PRINT:PRINT"           S
     PACEBAR TO CONTINUE"
5300 IF INKEY$<>" " THEN 5300
5310 CLS:GOTO 1110
5320 '
5330 TAGOFF
5340 LOCATE 1,20:PRINT"
        ":PRINT"              "
5350 LOCATE 1,20:PRINT pL$(pl);" WINS"
5360 GOSUB 5430
5370 LOCATE 1,20:PRINT" SPACEBAR TO PLAY
      AGAIN"
5380 GOSUB 5430
5390 GOTO 5340
5400 RUN 160
5410 a$=INKEY$:IF a$="" THEN 5410
5420 PRINT ASC(a$)
5430 DATA 239,268,0
5440 DATA 213,284,0
5450 DATA 190,319,0
5460 DATA 179,358,716
5470 DATA 179,239,716
5480 DATA 239,284,716
5490 DATA 239,239,716
5500 DATA 0,358,716
5510 DATA 179,239,716
5520 DATA 190,284,716
5530 DATA 179,319,716
5540 DATA 159,319,638
5550 DATA 159,213,638
5560 DATA 213,284,638
5570 DATA 213,213,638
5580 DATA 0,319,638
5590 DATA 213,213,638
5600 DATA 190,268,568
5610 DATA 179,253,506
5620 DATA 142,239,478
5630 DATA 159,190,478
5640 DATA 159,190,638
5650 DATA 179,213,638
5660 DATA 179,239,478
5670 DATA 190,239,478
5680 DATA 213,253,638
5690 DATA 190,268,638
5700 DATA 239,284,568
5710 DATA 239,239,478
5720 DATA 239,284,568
5730 DATA 239,301,602
5740 DATA 0,319,638
5750 DATA 999,999,999
5760 RESTORE 5430
5770 CO=0
5780 ENT -1,1,1,1,2,-1,1,2,1,1,1,-1,1
5790 ENT -2,2,1,1,4,-1,1,4,1,1,2,-1,1
5800 READ A,B,C
5810 CO=CO+1:IF CO=61 THEN GOTO 5880
5820 IF A=999 THEN RESTORE 5430:GOTO 580
     0
5830 SOUND 1,A,20,6,0,1
5840 SOUND 2,B,20,5
5850 SOUND 4,C,20,5,0,2
5860 IF INKEY$=" " THEN RUN 160
5870 IF CO<60 THEN 5800
5880 SOUND 1,179,120,7,0,1
5890 SOUND 2,284,120,6
5900 SOUND 4,716,120,6,0,2
5910 WHILE SQ(4)>127:WEND
5920 RETURN
```

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The Cash Book Accounting programs described below are designed for the small to medium sized business, whether a sole trader, partnership or limited company. All need an Amstrad 464 or 664, an 80 or 132 column printer and cassette or disk storage.

Each program has been specially written to use the computer's huge memory and is a 'stand alone' program. However, the Cash Book and Final Accounts programs also interface to produce a superb combination pack for really serious business users, as well as practising accountants.

Each program is supported by a comprehensive, easily followed manual, and 'user friendly' screen prompts with error trapping routines, which make a specialised knowledge of accountancy unnecessary for the average user. The software is, however, capable of advanced accounting use, and in order to fully appreciate and interpret the Balance Sheet a discussion with your professional adviser or Bank Manager may be advisable.

We confidently recommend these programs to serious commercial owners of the Amstrad, and hope they will enable you to operate your business on a more effective, efficient and profitable basis.

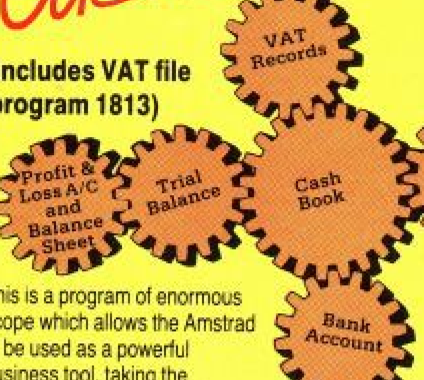
Dale J. Hubbard, Managing Director

Peter S. Meherne MIAP **Software Director**

THE **COMPLETE** CASH BOOK ACCOUNTING SYSTEM

Cash Book

(includes VAT file program 1813)



This is a program of enormous scope which allows the Amstrad to be used as a powerful business tool, taking the drudgery out of book keeping, and producing accurate and comprehensive management information.

In its simplest form the program will replace your Cash and Petty Cash books BUT Gemini's program, in effect, does much more. In addition to recording cash and bank transactions, the program will allow you to enter credit sales and purchases, and for all of these entries it will automatically complete the double entry routines, to ensure that your records are always in balance.

Sales and Purchase ledger control accounts are included, which makes the program ideal for integration with an existing manual sales or purchase ledger system.

The program also includes the following features:

1. Balance at Bank for up to 5 separate Bank Accounts.
2. Petty Cash in hand for up to 3 separate Cash Accounts.
3. A listing of all nominal account titles (maximum 199), most of which are user definable).
4. Monthly transaction summaries and departmental analyses of sales and purchases.
5. VAT memo account balances (sales/net purchases), and VAT accounts.
6. Batch printouts of all transactions entered in current program run.
7. Total debtors and creditors, sales, overheads and Trial Balance.

The program is therefore a complete 'stand alone' accounting software package, ideal for both business users, and practising Chartered Accountants, since an infinite number of different Cash Books may be kept on a single Amstrad.

A full audit trail of all data entered in the program is produced and a journal entry routine is incorporated to facilitate adjustments to individual nominal accounts, prior to producing a final Trial Balance. The latter interfaces automatically with Final Accounts program C.1806, so that a Profit and Loss Account and Balance Sheet can be prepared from data held in the Cash Book program.

Cassette C.1805 £59.95
Disk D.1805 £64.95

VAT File

Whilst this program will benefit most VAT registered businesses, it is also designed for those users who are on one of the special retailers schemes for VAT, which requires them to analyse their expenditure invoices over the various rates of VAT, in order to calculate their VAT output tax. The program will provide the following:

1. A means of recording invoices.
2. A printed copy of all invoice details.
3. Accumulated totals of different types of transactions.
4. The facility for coping with a multi-rated VAT system.
5. Information needed for the preparation of VAT returns.
6. The facility to sort and print transactions by date, invoice reference or customer/supplier name.

The package is capable of dealing with up to 140 transactions in a single batch and the different transaction types are processed in separate batches, which are then printed out as a permanent record. Cumulative totals for gross takings, VAT at standard rate etc. are stored in a data file on disk or tape which can be loaded at the start of every session to provide 'brought forward' totals for the program.

Cassette C.1813 £19.95
Disk D.1813 £25.95

Final Accounts

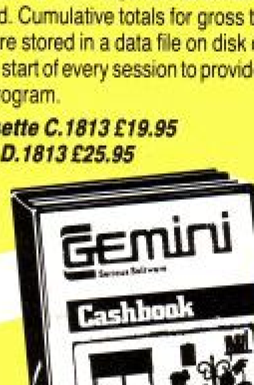
This program is designed to produce a Trading and Profit & Loss Account and Balance Sheet, either from the final Trial Balance produced by Cash Book program 1805 or from any other Trial Balance making it a truly stand alone 'Final Accounts' program.

The facility to produce these documents quickly, accurately, and regularly is of enormous help in running any business, large or small, since one shows the true profitability achieved, and the other the exact strength of the business in terms of assets and liabilities.

The program also allows insertion of budget or comparative figures which can be shown alongside the actual figures, together with notes to the accounts, and the opening Trial Balance for the following period.

Whether used by businessmen or practising Accountants, this program allows the Amstrad to be used as a real business computer producing vital information for decision makers with enormous ease and accuracy.

Cassette C.1806 £59.95
Disk D.1806 £64.95



Bona fide dealers, distributors and overseas licensees for Gemini software always required. Educational establishments contact us for details of our fuss-free licensing agreements.

Combination Packs

Designed to offer maximum value and convenience to serious business users, by combining several programs in one handy pack, together with their appropriate manuals.

Contains: Cash Book (including VAT file) and Final Accounts.

	Normal List Price of Programs in Pack	Combination Pack Price	Saving
C.1818 Cassette	£119.90	£89.95	£29.95
D.1818 Disk	£129.90	£99.95	£29.95

BEAUTIFULLY PACKAGED AND DOCUMENTED, THESE EXCEPTIONAL PROGRAMS PROMISE TO BECOME 'BEST SELLERS' FOR ALL AMSTRAD STOCKISTS, AND ARE CONFIDENTLY RECOMMENDED AS 'STATE OF THE ART' SOFTWARE FOR THIS POPULAR, COMPETITIVE HOME MICRO.

Database Management System

Unleash the data storage capabilities of your Amstrad with this powerful database program from Gemini, the market leaders in home computer software!

Your Gemini Database will allow you to store, retrieve and manipulate data in a variety of useful ways — just as you would with a manual card index system, but with extra capabilities, such as:

- Set up your own user-definable card layout in 40 or 80 column mode.
- Up to 20 fields allowed, each with 160 characters — to a maximum of 1000 characters per card. Up to 999 records available, making full use of the 464/664's memory capacity.
- Extensive mathematical and field relational expressions may be used, including totals and averages.
- Quickly sorts alphabetically or numerically, even names by surname if required, with or without case discrimination. Sorts may be performed on subsets of records on ANY field.
- Integrates with Report Generator (available separately) to produce standard mail-merged form letters, mailing labels up to 3 across page etc.
- Change record format at any time, add or delete fields after set-up.
- Completely user-definable field summaries available to both screen and printer — 40 or 80 column display mode.
- Delete records.
- Browse with instant edit/print/delete options.
- Simple menu-driven operation.
- Utilises machine code routines — no long 'garbage collection'.
- Files may be merged enabling the appending of files without tedious re-typing.
- Superbly documented in an easy to understand style — just as you would expect from Gemini!
- Comes with two documented demonstration files to show the extensive capabilities of the software.

Cassette C.1801 £19.95
Disk D.1801 £25.95

Report Generator

Requires Gemini Database Program No. C.1801 and Printer

This program will allow you to present and print your Gemini Database data in formats that you design yourself on-screen.

Look at some of the ways in which you can use it:

- Re-arrange your record layout to meet specific printed requirements.
- Create sets of mailing list labels from database records, up to three across your printer.
- Create documents inserting merged fields into text, just like the expensive word-processors!
- Design field summaries for columnar presentation of data, and total any given column.
- Ideal for mail-merged standard letters.
- Create any number of standard documents from one database file.
- Will even right-justify documents, automatically adjusting for variable length merged data.

Technical Details

RECORD MODE: 1600 characters of text available, including field data. Headers and Footers may be entered when using printer paging options.

MAILING LABEL MODE: 1-3 labels across page, with automatic compacting of lines to sequence the printer.

DOCUMENT GENERATOR MODE: 3200 characters available per document, with merging of up to 20 fields in any position on document. Any field may be used more than once. Automatic justification.

FIELD SUMMARY MODE: Up to 20 fields may be specified, maximum of 160 characters each.

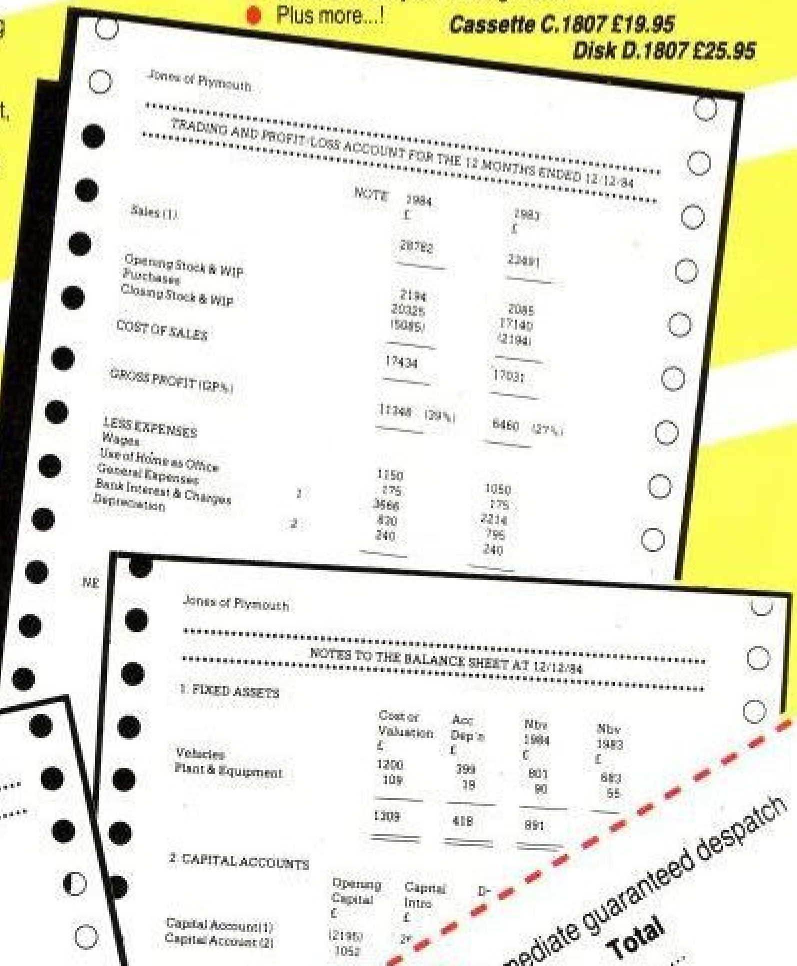
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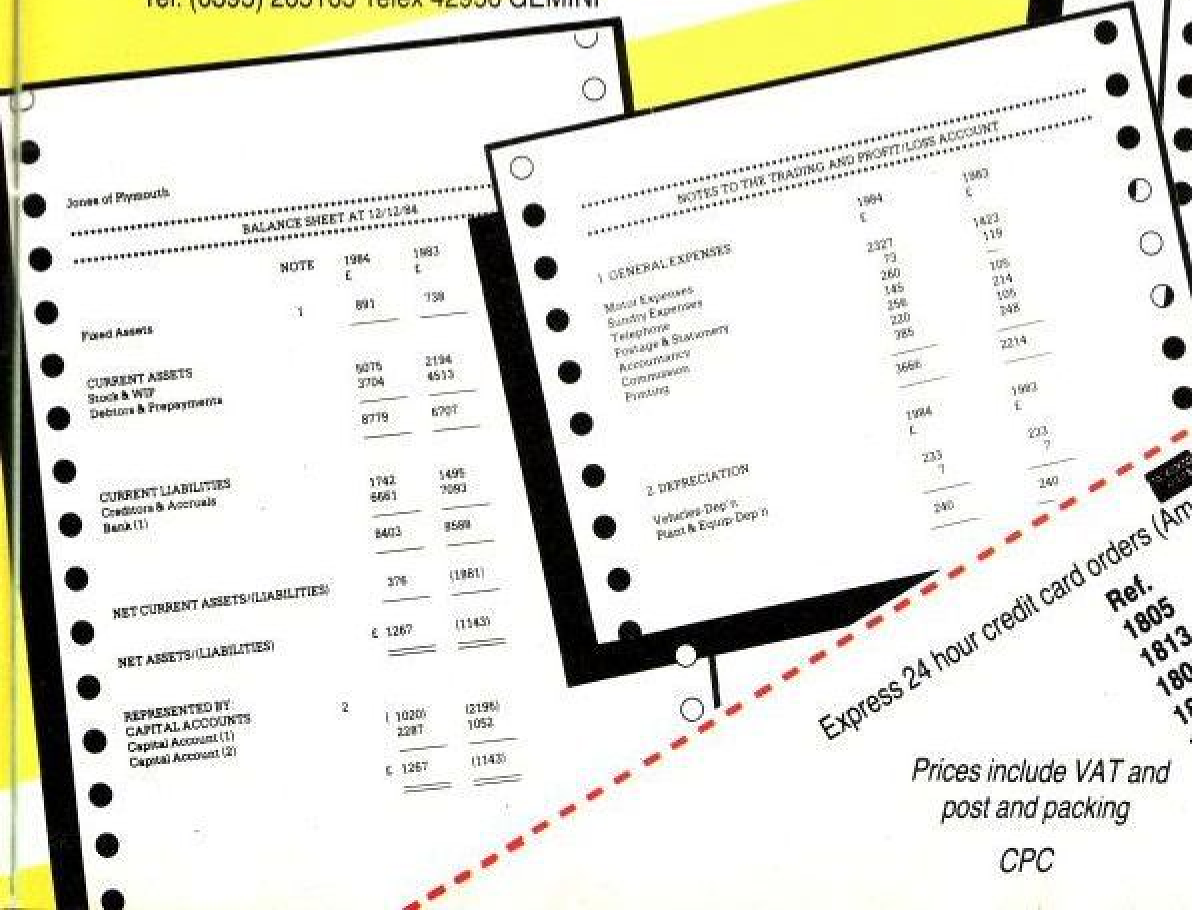
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The Gemini Amstrad Home Accounts is a suite of two programs offering comprehensive management of home finances. It is quick and easy to use and includes the following main features:

- Computer aided budget design.
- Up to 30 expenditure allocations.
- Financial year may start with any month.
- Amendments to budget at any time.
- Up to 24 characters per transaction.
- Automatic warning if bank charges likely.
- Forecasting of balances and expenses.
- Bar charts of budget/actual income/expenditure.
- Various printer routines.
- Powerful search routines including:
  Date, or range of dates
  Allocations
  Transaction details (specific name)
  Credits
  Combinations
- Simple to check account totals and running totals against budget at any time.
- All account entries sorted into date order if required.
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- Date entry validation.
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- Plus more...!

Cassette C.1807 £19.95
Disk D.1807 £25.95





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Ref.	Item	Cass/Disk	£ each	Total
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1813	VAT File			
1806	Final Accounts			
1818	Combination Pack			
1801	Database			
1820	Report Generator			
1807	Home Accounts			

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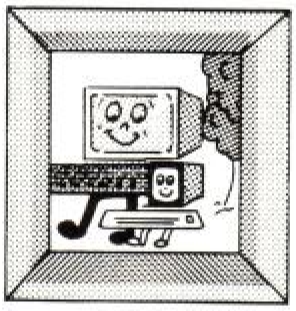
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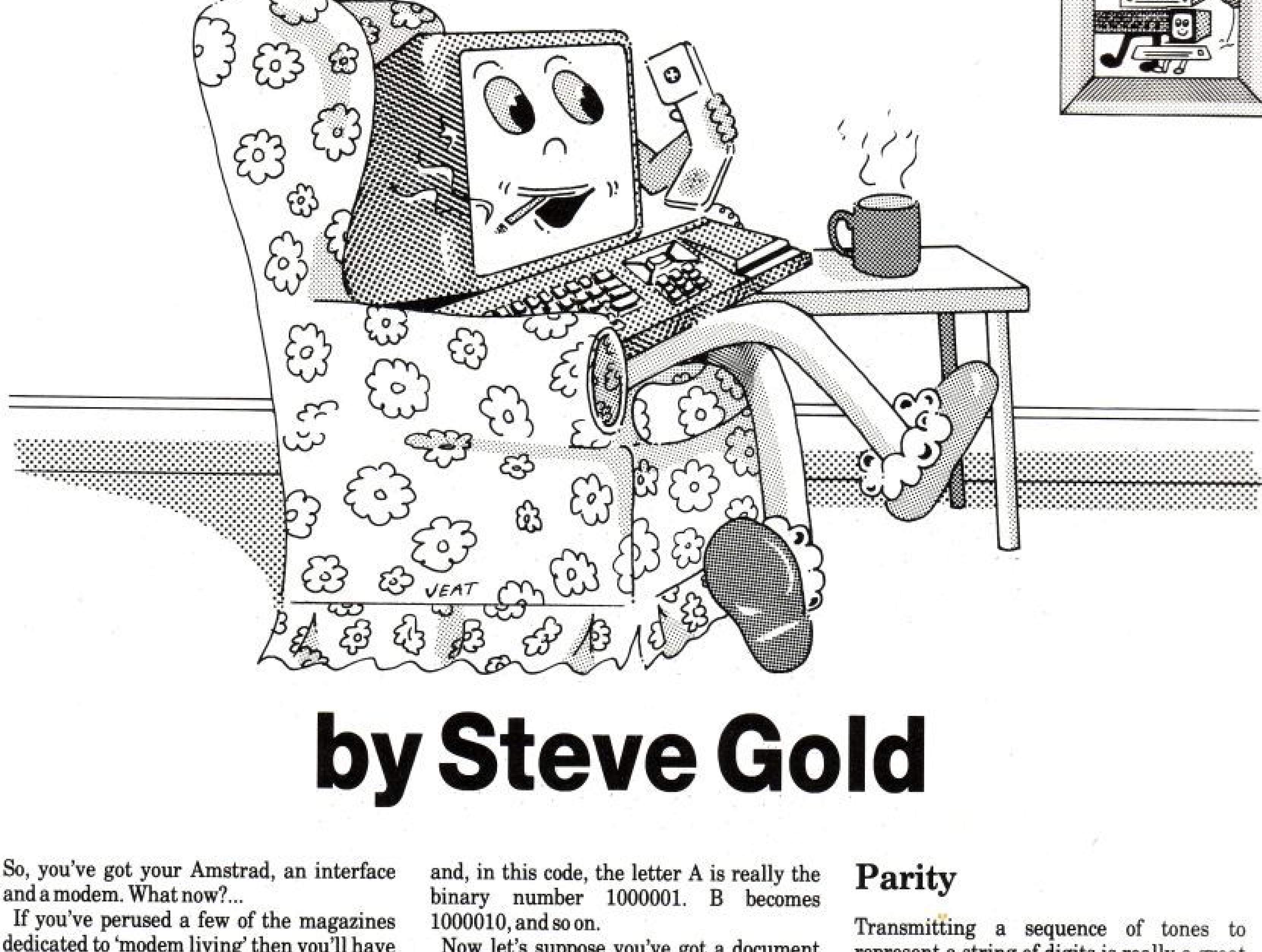
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FEATURE

TELECOMPUTING WITH YOUR AMSTRAD





by Steve Gold

So, you've got your Amstrad, an interface and a modem. What now?...

If you've perused a few of the magazines dedicated to 'modem living' then you'll have realised that there is whole new sub-culture out there, chock full of communications buzzwords such as 'parity', 'baud rate' and the like. This article will, I hope, guide you through the trauma of getting your machine 'on-line'.

Having read your user manual(s) thoroughly, you'll need to have a modest understanding of a few of the components to which your computer is attached. The modem and the serial port are important accessories.

Your computer operates in a binary language of ones and zeros. This binary language is due to the fact that all a computer really knows how to do is to throw thousands of microscopic, internal switches very quickly to off and on states.

For instance, when you type the letter 'A' on the Amstrad's keyboard, the CPU (Central Processing Unit) has it's own two-numbered way of dealing with that letter. It is called the ASCII binary code, and, in this code, the letter A is really the binary number 1000001. B becomes 1000010, and so on.

Now let's suppose you've got a document already composed on tape or disc. What's really recorded on the tape or disc is the binary encoded sequence that represents each of the letters one after the other - a very long string of ones and zeros. Using a modem, (short for MOdulator - DEModulator) you can squirt the string of zeros and ones down a 'phone line as a series of representative tones, which may then be decoded at the other end to produce the original document again. Your modem 'talks' to other modems using the 'phone line.

Now, that's all very well and fine, but, just as there are different TV encryption systems round the world, so Murphy's law dictates that there are several different 'protocols' in use for modem transmission. These protocols are defined by the three major variables:

Parity
Baud Rate
Duplex

Parity

Transmitting a sequence of tones to represent a string of digits is really a great idea, but how does a modem recognise when one character has finished and the next starts? The method by which most computers do this is called 'asynchronous transmission'. Many computers add a process called 'parity checking', and as you'll have come to realise in the computing world, this is a complex sounding name for a really simple idea.

Each character in the ASCII 7 bit code has a start bit added to it. The start bit is always a 0, and tells the receiving computer to expect an ASCII letter. After the ASCII letter is sent, an extra bit, known as a 'parity bit' may be added on. If the parity check is 'even', then the sum of all the bits in a character, including the initial 0, and the final parity bit will produce an even number. Odd parity gives a sum total that is an odd number. If the receiving computer gets a checksum that is even, when odd parity is being used, it means there has been a transmission error, and, depending on the

software package, will take appropriate action. Appropriate action means either notifying the recipient of such an error (usually on-screen), or automatically requesting re-transmission of the data concerned.

The parity bit is not usually acted upon in small computer communications, but 'stop bits' are. A stop bit, like the start bit, is one or two binary numbers which follow the parity check bit. The stop bit is really a sort of end flag that notifies the receiving computer that one letter has ended, and to await the next start bit. Most communications protocols in this country use one stop bit.

Baud Rates

When you drive a car, your speed is measured in miles per hour. When you transmit words and information by computer, your speed is measured in baud. Unfortunately 300 baud does not, despite much misleading information to the contrary, translate to a given number of characters per second. This is because, as you'll have seen above, each character is represented by a series of tones. At 300 baud, each tone lasts a fraction over 3.3 milliseconds, which (assuming 7 bit ASCII code) together with one start and stop bit, means that each character is 9 bits long. Working this out, we get a maximum of 29.7 characters that may be sent every second.

300 baud is used by the vast majority of Bulletin Board Systems in use in this country. Because of the Prestel rates of 1200 receive, and 75 transmit, some are coming on-line using this rate as an option. In practice, whilst receiving data at 1200 baud is fine, uploading at 75 baud is not, so you will find that 300 baud is the most popular BBS rate.

Duplex

Obviously, just having one computer squirt information to another is not satisfactory, particularly when the other computer wants to talk back. So modems are devised so that they can permit simultaneous operating where both can talk at the same time. Naturally, two different sets of tones must be used with 300 baud, so that the signals do not get confused. One modem works in the 'originate' mode, and the other in 'answer' mode. This is known as 'full duplex' and is almost universal in its acceptance as a standard in the UK today. Half duplex, where the computer can only receive or transmit at a given time, evolved in years gone by, to allow cheaper modem components to be used. Duplex is not applicable to 1200/75 transmission as, obviously, different tone channels are used in this system.

Plugging in

I hope by now you'll have grasped some of the basic principles involved in computer communication. Armed with this information then, let's look at what services are available.

Services accessible via your modem fall into two distinct categories; free and chargeable. The free ones are usually (B)ulletin (B)oard (S)ystems, and are usually run by an enthusiast who devotes a lot of time, money and effort to get a system up and running. Because of the cost, involved often a BBS will operate limited hours, and on one 'phone line, which, since there are tens of thousands of modems all (theoretically) wanting to use the few dozen BBS's already in existence, makes for a lot of engaged tones! In practice, you'll find that by using off-peak times (early evening and very early morning) you'll stand a better chance of getting through.

Remember though, that a BBS represents a lot of time and effort on the part of a SYStem OPerator (sysop), and it is only due to his/her good nature that you are allowed to use it, so please, no bad language, and no electronic graffiti! A list of publicly accessible BBS's is given at the end of this article.

Chargeable systems make you pay for the service because they invest great sums of money into providing a professional service available on a great number of dial-up ports, thus virtually guaranteeing you access 24 hours a day - whenever you want. Often, by means of a special service called (P)acket (S)witch (S)tream, they enable you to save on phone bills by giving you a special local 'phone number to dial, even though they may be hundreds of miles distant. Because of the resultant savings on 'phone bills, which can total up to three pounds an hour, the hourly connect rates for such services are relatively quite high.

Most readers will be able to have a lot of fun simply by calling up their local BBS, but, as you become more experienced in the use of your modem, and your thirst for information increases (in proportion to your telephone bill!) you may like to try these services. Space is too limited for me to provide much information about the services, but again, at the end of this article, you'll find lots of addresses for you to write to for free information.

Your 'phone bill

Naturally, using the 'phone isn't free. Nor is it, in spite of the horror stories of multi-thousand pound 'phone bills, devastatingly expensive.

If you restrict your usage to 'cheap rate' (any time other than 8am to 6pm, Monday to Friday), your bills will be manageable. You'll find it useful to keep a log of your calls, as this will often solve the family disputes that inevitably arise when the bill arrives. As a general rule of thumb, cheap rate local calls cost around 40 pence an hour, whilst short haul direct dial calls weigh in at £1.20 an hour. Really long distance calls (over 50 Km) will set you back up to £4.00 an hour, so watch out for these. If you call the telephone operator and ask for FREEPHONE TELEPHONE SALES, they will send you information on 'phone charges appropriate to your area - and the call to the sales office is free!

As with all things, moderation is best. I think you'll find modem living to be a cheap source of good entertainment.

A few useful names and addresses:

American Peoplelink,
Arlington Ridge Office Center,
3215 N Frontage Road,
Suite 1505,
Arlington Heights,
IL 60004,
USA.
Tel: 0101 312 870 5200

Association of Free Public Access Systems,
(Please include an SAE) -
Fred Brown,
421 Endike Lane,
Hull HU6 8AG

CompuServe Inc.,
5000 Arlington Center Blvd.,
Columbus,
Ohio 43220,
USA.
Tel: 0101 614 457 8600

Dialog Information Services,
PO Box 8,
Abingdon,
Oxford OX13 6EG
Tel: 0865 730969

Packet Switch Stream Marketing,
British Telecom National Networks,
Seal House,
London.
Tel: 01 920 0661

Telecom Gold Marketing Dept.,
Sales Administration,
60-68 St. Thomas Street,
London SE1 3QU
Tel: 01 403 6777

The Source Telecomputing Co. Inc.,
1616 Anderson Road,
McClean,
Virginia 22102
USA.
Tel: 0101 703 821 6666

If you need assistance on 'Comms' matters, then please leave a message on the 'London Underground' (01 863 0198), or, if you have access, on any of the following networks:

CompuServe 76011,1155
Prestel 01 278 3143
Source BBY 284
Telecom Gold 83:JNL 113

ACU

QA

Problems solved, Questions answered, Hints supplied, Universes saved etc.

Q:

A few weeks ago I started getting the occassional 'Read Error b', since then it game from occasional to continual, with the odd 'Read Error A' thrown in.

It is virtually impossible to load any program that has 'SAVED' successfully. Pre-recorded tapes such as 'ROLAND' still seem to load OK (I had one read error but loaded with a second go).

CODENAME MAT seems to load OK but doesn't appear to be playable. I haven't seen a planet yet, although the readings suggest I am close enough to touch it. Zapping aliens has no effect either.

Before the "ERROR" occurs I can tell it will happen from the sound. It seems distorted compared to the sound from "SAVE". One gets the feeling that the tape is slowing and speeding up, in particular when there is more noise. Its as if the data slows the tape down. You can in fact see that the lift spool appears to slow down and then take off again. The fault occurs with all tapes including AMSOFT, and top brand audio tapes.

R.J. Thomas.
Leicester.

ACU: *If you find that you are getting an unacceptable number of these error messages with several different cassettes, your datacorder could possible have a faulty motor. In this instance you should return the computer to your retailer for repair. Some loading errors may be due to incorrect head alignment. This will need to be corrected by a qualified engineer. Re-aligning the cassette deck yourself could mean that nothing loads afterwards. Whatever you do try cleaning the heads first.*

Q:

```
10 ON ERROR GOTO 100
20 PZINT "HELLO"
30 END
100 ERROR ERR : END
RUN
```

(Should report 'Syntax error in 20')

```
Syntax error in 100
```

(ie the ERROR command reports the line on which it, and not the error, is to be found)

ACU: *If you use the ERROR command then the BASIC will report the error as having happend on the line containing the ERROR command. This is what is intended. If you use an ON ERROR GOTO construction then you have access to the failing line number and error code until another error occurs, or a RESUME command is executed. An ERROR command is treated exactly as if an error had occurred.*

Q:

While writing fairly simple programs I found the following:

```
DIM a (10)
10 DEF FNy(x)=x+1
20 FOR b= 0 To 4
30  a(FNy(b)) = 0
40 NEXT
RUN
```

(Should initialise a(10 to a (50))

Unexpected NEXT in 40

(ie indexing an array by a function disrupts the return stack)

ACU: *It is not possible to use a User Function as an array subscript.*

Q:

```
10 FOR a=1 TO 10
20 REM | (shift@)
30 NEXT
RUN
```

(Should just pause for a short time)

```
NEXT missing in 10
```

(ie the search for a matching next is disabled by the shift† sign)

ACU: *The programmer should avoid using characters other than those with ASCII in the range 23-123 and 125-127 in a REM statement.*

ACU

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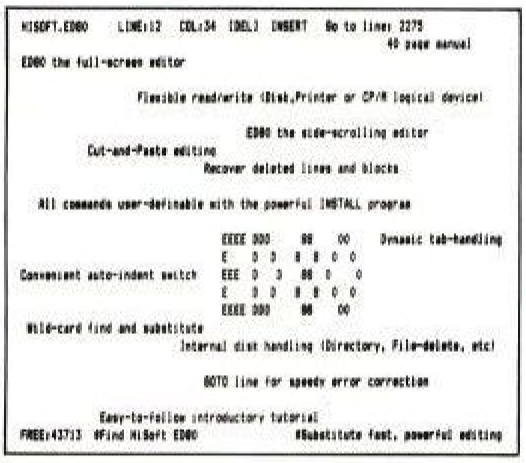
for CP/M

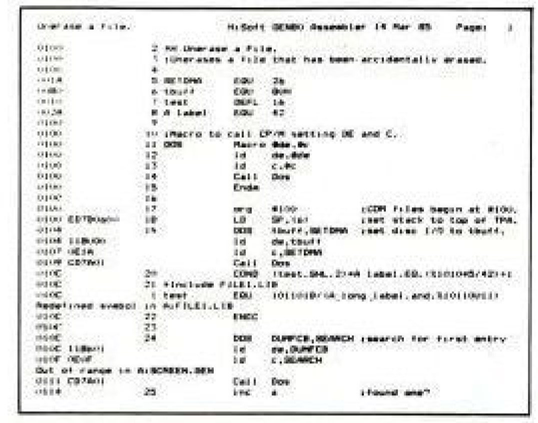
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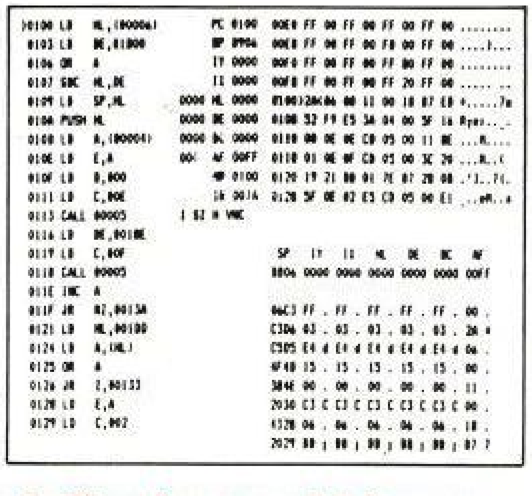
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As with Devpac, there are two versions of HiSoft Pascal for the Amstrad computers, one Amsdos compatible and the other CP/M compatible.

The Amsdos version of HiSoft Pascal fully supports both cassette and disc (via Amsdos), comes complete with a turtle Graphics package and many procedures and functions for interfacing with the firmware.

The CP/M version (Pascal80) is supplied with ED80 (our full-screen, Wordstar-compatible editor), example Pascal programs (including an extensive disassembler) and supports sequential file handling.

Pascal is undoubtedly a powerful programming language and the combination of HiSoft Pascal and the Amstrad computers adds fast, easy development. Unbeatable!

Prices:

Pascal	Pascal80 (CP/M)
£29.95 (tape) £34.95 (disc)	£39.95 (disc)

HISOFT SOFTWARE

FONT 64 (nee FONT 464!): an easy-to-use font designer enabling you to design, edit and save your own characters and graphics; there are 6 pre-designed fonts and the package comes complete with sophisticated printer-driving software which allows high-resolution screen dumps and letter writing on Epson compatibles and the DMP-1. £7.95 (tape). £12.95 (disc).

THE TORCH: an extensive, disc-based tutorial that illuminates the mysteries of the CP/M operating system. Plus an easy-to-use menu system. £12.95 (disc).

THE KNIFE: hack your discs into shape with this powerful disc maintenance program, recover unerased files, cut and paste sectors, learn how files are stored on disc, you have unlimited power over your discs with The Knife! £12.95 (disc).

HISOFT C: watch out for the Amstrad version of our highly acclaimed C compiler – it will be well worth the wait!

HISOFT DEVPAC

The **standard** assembly language package for the Amstrad CPC computers available on tape or disc. Devpac is used by leading software houses to develop their commercial software because it **is** standard. Devpac is a complete machine code development package with Z80 assembler/editor and front panel disassembler/debugger: features include – standard Zilog mnemonics, powerful assembler commands, conditional assembly, assemble text from tape or disc, full support of tape and disc, labelling disassembler, multiple breakpoints, memory search, single-step etc.

Devpac80 (our CP/M version) has all the above features plus much, much more: it runs under the CP/M disc operating system, comes complete with a full-screen editor (ED80) and takes full advantage of CP/M allowing disc-to-disc assembly, virtual disking, full Zilog macros, full Zilog expressions, printer files, disassembly to disc etc. etc. The **new standard** in assembler/debugger packages.

Please feel free to write for full technical specifications of both products.

Prices:

Devpac	Devpac80
£21.95 (tape) £26.95 (disc)	£39.95 (disc)

SOON TO BE RELEASED IN ROM!!!

CP/M is a Trademark of Digital Research Inc.

No Sweat!



Rules:

1 The winners will be the first 25 correct entries drawn on July 30th 1985.

2 There is no limit to the number of entries any individual can make, however each entry must be on an official entry form. Photocopies cannot be accepted.

3 Entries should be sent to:
Amstrad Computer User Magazine
Confuzion Competition
169 Kings Road
Brentwood
Essex
CM14 4EF

4 No correspondence can be entered into regarding the competition. No entries can be returned.

The judges decision is final. No employees of Amstrad, Amsoft, Amstrad User or their relatives may enter.

Confuzion is the best-selling puzzle solving game. You have to guide a spark through up 64 different levels. The game is very addictive, even the Editor got hooked.

Some snazzy softwear is on offer to 25 people who can prove that a simple puzzle does not leave them Confuzed. Look at the photo on this page. It shows a typical Confuzion screen. Explain how to slide the blocks about to leave a straight path from the spark to the bomb. Unlike the real game you cannot move the blocks once the spark has started its travels. So if yo though that the best moves were Right, Up, Left, Down that is what you should fill in on the entry form. Of course that isn't the right answer (Even Amstrad Computer User Competitions aren't that easy).

Entry Form.

I'm not Confuzed, I think the moves should be ....

....

Name ....

Address ....

....

My sweatshirt size is ....

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KNIGHT LORE

"EASILY THE BEST PROGRAM THE AMSTRAD HAS EVER SEEN ... awesome, intricate graphics ... enough to make most software houses pack up and go home ... if you have an Amstrad, you should start whooping for joy." (PopCompWkly) "How do you describe software so good it makes 'Jet Set Willy' look feeble? Stunning 3D and full of tricks to learn." (Amstrad User) "Quite simply the most technically awesome game Ultimate have released." (PersCompNews) STICK OR KEYS. (Ultimate) **CASSETTE £9.95**

COMBAT LYNX

"Probably the most comprehensive realtime battle simulation program ever written for a home computer ... it is worth every minute." (PersCompToday) "If you want a complex, challenging strategy game, then this is a must." (HomeCompWkly) Air-to-ground battle simulation as you fly your Lynx helicopter. Realtime combat, a game can last 5 hours! 4 skill levels: 30 re-definable command keys. SAVE HI-SCORE TABLE. STICK OR KEYS. (Digital) **CASSETTE: £8.95**

DECATHLON

This double-sided tape has deservedly been in the charts for ages and now it's on the Amstrad too. It is astonishing value-for-money as well as exciting. Compete in ten different field and track sporting events: good screen display and great animation of you, the athlete. You see the number of attempts, points scored, world record, qualifying time and distances. The crowd are encouraging! A classic joystick waggler. STICK NEEDED. (Ocean) **CASSETTE £8.95**

STEVE DAVIS SNOOKER

CDS claim that their 'true-to-life' ball movement is unmatchable. It's certainly better than anything else we've seen for any micro. Normal snooker rules. You can reset previous shot, define spin accurately, nominate colour. Infinitely variable speeds. Highest break table. 1 or 2 players. STICK OR KEYS. (CDS) **CASSETTE £7.95**

TASWORD

"If you have been looking for a word processor, then look no further ... an excellent program." (Crash) "Explained very clearly, with excellent self-teaching tutorials ... a comprehensive and user-friendly package for both home and professional use ... highly recommended." (HomeCompWkly) TASWORD is the best word processor for your Amstrad. Text is printed just as it appears on-screen. Impressive list of features and helpful manual. TASWORD 464D (disk) version includes NEW mailmerge facility for personalizing standard letters and uses larger memory well. NO STICK. (Tasman) **CASSETTE £19.95 DISK £24.95**

DARK STAR

"The graphics and stereo sound are spectacular and convincing ... the whole action is fast, smooth and well orchestrated ... A LEADER IN SPACE-FLIGHT SIMULATIONS." (Amstrad User) "Try as I may, I can't think of a better arcade game." (PersCompNews) If it moves, shoot it: if it's square, fly through it. There are 256 sectors in the galaxy and six skill levels. CUSTOMIZE feature lets you personalize the game. NO STICK. (DesignDesign) **CASSETTE £7.95**

STRIP POKER

"Even without the strip feature, this game would still be very compulsive ... the scene where the girl removes her dress is very well done ... the movements are all natural and the effect is quite convincing." (Amstrad Use) A very well animated game of 5-card draw poker with some of the biggest animated graphics you have ever seen. You can raise, stand, fold, or bet but you cannot cheat. MINDY, modest Mindy is your opponent. Be careful of her bluffing. Mind you, she doesn't always bluff... NO STICK. (Knightsoft) **CASSETTE £8.95**

SORCERY

"Without doubt the most strikingly produced game I've seen to date for the Amstrad." *(C.T.W.) "Wonderful ... the graphics are beautifully designed to an incredible degree of detail. This cartoon detail extends throughout all 40, quite different, screens." (PopCompWkly) "Stunningly sharp, colourful graphics and a truly infuriating and fascinating plot ...* **CERTAINLY THE BEST GAME YET FOR THE AMSTRAD."** *(Micro Adventurer)* STICK NEEDED. (Virgin) **CASSETTE £8.95**

FIGHTER PILOT

"THE FLYING IS THE BEST I'VE COME ACROSS ... it wins too on graphics and instrumentation." (PCGames) "The game with the most playability and the longest-lasting appeal I have played on the Amstrad . . . months of flying here." (CVGames) "A superb flight simulation with full instrumentation and marvellous moving horizon cockpit views." (Computer Choice) STICK or KEYS (Digital) **CASSETTE £8.95**

EMERALD ISLE

"All you lot out there with twisted minds and plenty of time on your hands are going to love this." (Amstrad User) 230 beautifully drawn locations, plus over 30K of well-written text. 2 full-colour posters free and clue sheet available. An astonishing bargain and a great graphic adventure! NO STICK (Level 9) **CASSETTE £6.95**

MINI OFFICE

"Quite exceptional value ... the first affordable program suite ... I strongly recommend beginners get this first." (PersCompNews) 4 programs on one tape, all working with Epson-compatible printers. **WORD PROCESSOR: DATABASE: SPREADSHEET: GRAPHICS.** The perfect introduction to these classic programs. NO STICK (Database) **CASSETTE £5.95 DISK £9.95**

MACHINE CODE TUTOR

"Colorful, clear, interactive computer teaching package – the best I've come across in any field." (PopCompWkly) "Well thought-out, aesthetically pleasing and (as far as I could tell) bug-proof and crashproof ...an excellent idea, well-executed." (Computing Today) Over 70K of data loads in 4 parts from 2 cassettes, with lessons and exercises to teach you complete machine-code. Clear, helpful manual. NO STICK (New Generation) **TWO CASSETTES £14.95**

MASTERCALC 464

"The easiest program of all to use ... the manual is by far the best." (PopCompWkly) "There is a professional feel about it which makes it stand out from the rest." (PersCompNews) The perfect spreadsheet for the Amstrad. All m/code. Up to 3,000 cells. 0 – 7 decimal places. Variable column width. Insert/erase column/row. GRAPHIC BAR CHARTS. Hi-res screen copy with Epson-compatible printers. NO STICK (Amsoft) **CASSETTE £24.95 DISK £29.95**

MASTERFILE

"A real landmark in terms of quality and price ... without question the best ... presentation is superb ... well-written manual makes learning the program very easy." (PopCompWkly) The most flexible, most sophisticated filing system you will find for the CPC464/664. All m/code and now with relational files. NO STICK (Amsoft) **CASSETTE £24.95 DISK £29.95**

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PHONE NO: if any, in case of query

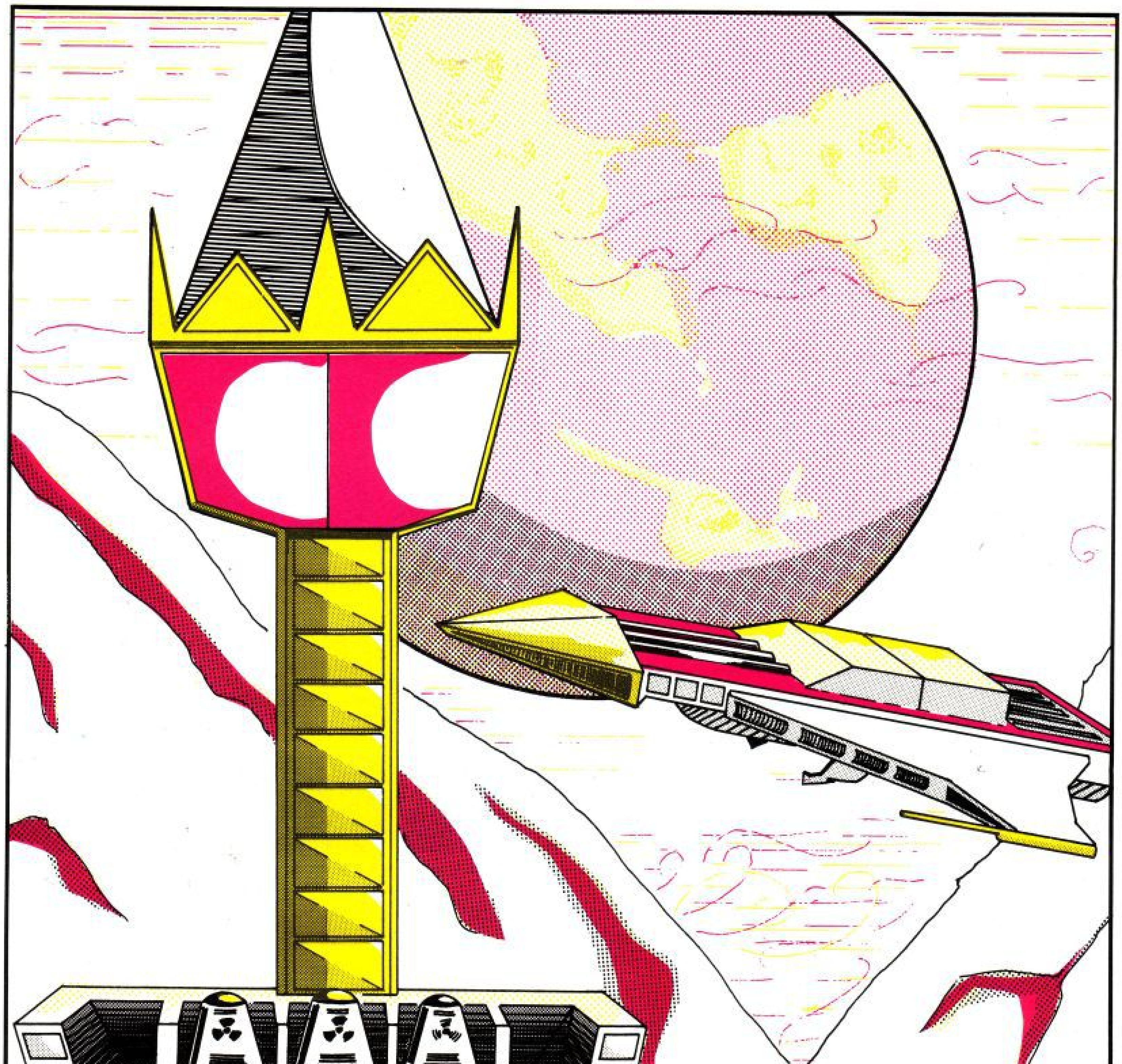
Program Name	Cass/Disk	Price
Postage & Packing	UK add 75p per order	
	Europe ADD £1.00 per program	
	Outside Europe ADD £1.50 per program	
	Total Order	

Moon Base Alpha.

By Martin Adams

It is a race against time. The solar flares are coming. You are trapped on the moon and must manoeuvre the radioactive stores to the safety of the underground bunker. Your only hope is to build the radio tower before the second flare hits. Unfortunately the radio tower is covered in the radioactive cells. To move the cells you command a small spaceship, fuel is limited so time has to be spent refilling from the tank. The design of the tower is complicated and you will need to study the map.

The program works with either a joystick or keyboard controls. Hazards include running into walls and fuel cells and an explosion caused by dropping the cells. You only get one life so be careful.



```
10 REM ******************************
20 REM *   Moon Base Alpha          *
30 REM * by Martin Adams            *
40 REM *                            *
50 REM *                            *
60 REM *                            *
70 REM *                            *
80 REM ******************************
90 REM
100 REM **** initialisation cold ******
110 REM
120 DEFINT a-p,r-z
130 MODE 1
140 INK 0,0:BORDER 0:PAPER 0:INK 1,24:IN
    K 2,26:INK 3,15
150 LOCATE 13,12:PRINT"Moon Base Alpha"
160 FOR i=1 TO 3000:NEXT i
170 DIM scoret[10],namet$[10]
180 rock=14:g1=127:g2=143:g3=251
190 upj=72:downj=73:leftj=74:rightj=75:l
    iftj=76
200 upk=0:downk=2:leftk=8:rightk=1:liftk
    =9
210 SYMBOL 251,60,126,255,255,255,255,25
    5,102
220 SYMBOL 252,31,63,127,225,127,63,31,0
230 SYMBOL 253,255,255,255,195,255,255,2
    55,126
240 SYMBOL 254,248,252,254,135,254,252,2
    48,0
250 SYMBOL 255,0,0,0,240,240,0,0,0
260 GOTO 330
270 REM
280 REM ********* play again? **********
290 MODE 1:PEN 1:PRINT "would you like t
    o play again (y/n)?"
300 IF NOT INKEY(46) THEN CALL &BC02:BOR
    DER 1:PAPER 0:PEN 1:CALL &BB03:CLS:E
    ND
310 IF INKEY(43) THEN 300
320 REM
330 REM ***** instructions *******
340 REM
350 CLS:PRINT" You are a science officer
     and have been";
360 PRINT:PRINT"posted to Moon Base Alph
    a. A large solar";
370 PRINT:PRINT"flare eruption is immine
    nt and the"
380 PRINT:PRINT"situation is critical."
390 PRINT:PRINT" You must finish buildin
    g the radio"
400 PRINT:PRINT"tower and move the store
    s equipment"
410 PRINT:PRINT"into the bunker before t
    he 2nd flare"
420 PRINT:PRINT"hits."
430 PRINT:PRINT" You can only survive th
    e flares in the"
440 PRINT:PRINT"bunker so keep a watch o
    n the two stage"
450 PRINT:PRINT"radiation alarm."
460 LOCATE 20,23:PRINT"GOOD LUCK."
470 GOSUB 4420
480 PRINT" Your controls are shown below
     and you  can use either joystick or
     cursor keys."
490 PRINT:PRINT " ";CHR$(242);"  to move
     ship left."
500 PRINT:PRINT " ";CHR$(243);"  to move
     ship right."
510 PRINT:PRINT " ";CHR$(240);"  to move
     ship up."
520 PRINT:PRINT " ";CHR$(241);"  to move
     ship down (free fall)."
530 PRINT:PRINT" copy/fire to operate gr
    abs."
540 PRINT:PRINT" z to operate engines."
550 PRINT:PRINT" d to operate bunker doo
    r."
560 PRINT:PRINT" p to display plans."
570 PRINT:PRINT"Note- when refueling swi
    tch engines off."
580 GOSUB 4420
590 REM
600 REM **** initialisation warm *****
610 REM
620 DIM screen[40,25]
630 score=0:score1=0:score2=0:scoref=0:c
    ount=2
640 timeout=0:yellow=0:orange=0:alarmdel
    ay=3
650 engines=-1:upflag=0:grab=-1:shipend=
    0:objectexplode=0:outside=0
660 velocity=0:objvel=0:objectupflag=1:o
    bjecttype=0:maxvel=3
670 alive=1:timestrand=24:done=0:ctime=1
    500:alarm=0:door=1:maxfuel=10000:fue
    l=9000
680 REM
690 REM ***** scene set up *******
700 CLS:GOSUB 4060
710 REM
720 REM **** object set up *****
730 objy=19:FOR objx=19 TO 25 STEP 2:GOS
    UB 2270:NEXT objx
740 objy=18:objx=20:GOSUB 2340:objx=24:G
    OSUB 2340
750 objy=17:FOR objx=17 TO 25 STEP 4:GOS
    UB 2340:NEXT objx
760 objx=19:objy=15:GOSUB 2340
770 objy=16:FOR objx=17 TO 25 STEP 2:GOS
    UB 2270:NEXT objx
780 objy=24:FOR objx=6 TO 12 STEP 2:GOSU
    B 2460:NEXT objx
790 objy=23:FOR objx=6 TO 14 STEP 4:GOSU
    B 2340:NEXT objx
800 objy=22:FOR objx=7 TO 13 STEP 2:GOSU
    B 2460:NEXT objx
810 objx=14:objy=24:GOSUB 2270
820 objy=21:objx=7:GOSUB 2270:objx=10:GO
    SUB 2340
830 objy=17:objx=19:GOSUB 2460:objx=23:G
    OSUB 2460:objx=13:objy=21:GOSUB 2270
840 objx=23:objy=15:GOSUB 2460:objx=25:G
    OSUB 2460
850 REM
860 REM ***** ship place ******
870 PEN 3:x=21:y=24:GOSUB 1320
880 REM
890 REM ***** panel set up *****
900 GOSUB 3200:GOSUB 3000
910 REM
920 REM **** engine and alarm sound set
    up ****
930 EVERY 25,1 GOSUB 2880
940 REM
950 REM ***** main loop *****
960 IF NOT INKEY(27) THEN GOSUB 4380:GOS
    UB 2500:REM plans
970 GOSUB 1180:REM ship control
980 IF engines=1 THEN IF grab=1 THEN ton
    e=1700-objecttype*500:fuel=fuel-10*o
    bjecttype ELSE fuel=fuel-5:tone=1100
    :GOSUB 2170
990 IF fuel<0 THEN fuel=0
1000 IF fuel>0 THEN 1020
1010 engines=-1:IF x<>37 OR y<>3 THEN GO
     SUB 1540:GOSUB 3270:IF done=1 THEN
     shipend=1:CLS:PRINT"You ran out of
     fuel, were stranded and":PRINT:PRIN
     T"perished when your life support s
     ystems":PRINT:PRINT"failed.":GOTO 1
     130
1020 IF engines=-1 THEN upflag=0
1030 IF upflag=0 THEN GOSUB 1660:REM fal
     l chuck
1040 IF shipend=1 THEN GOSUB 3750:GOTO 1
     130
1050 fueling=0
1060 IF x=37 THEN IF y=3 THEN IF engines
     =-1 THEN fueling=1:GOSUB 2950:REM f
     uel load
1070 GOSUB 1540:REM panel update
1080 ctime=ctime-1:IF ctime>0 THEN 950:R
     EM loop back
1090 yellow=0:orange=0:count=count-1
1100 FOR i=1 TO 20:INK 0,24:FOR j=1 TO 2
     00:NEXT j:INK 0,0:NEXT i
1110 GOSUB 3820
1120 IF shipend=0 AND  count>0 THEN ctim
     e=1500:GOTO 950
1130 GOSUB 4460:FOR i=1 TO 5000:NEXT i
1140 GOSUB 3480:GOSUB 3310:REM calculate
      & display scores
1150 ERASE screen
1160 GOTO 280:REM play again?
1170 REM
1180 REM ***** ship control *****
1190 IF engines=-1 THEN 1240
1200 IF NOT INKEY(upj) OR NOT INKEY(upk)
      THEN velocity=0:IF upflag=0 THEN u
     pflag=1:RETURN ELSE direction=1:GOS
     UB 1400:GOTO 1280
1210 IF NOT INKEY(downj) OR NOT INKEY(do
     wnk) THEN upflag=0:direction=2:IF g
     rab=-1 THEN GOSUB 1400:RETURN ELSE
     RETURN
1220 IF NOT INKEY(leftj) OR NOT INKEY(le
     ftk) THEN velocity=0:upflag=1:direc
     tion=3:GOSUB 1400:GOTO 1280
1230 IF NOT INKEY(rightj) OR NOT INKEY(r
     ightk) THEN velocity=0:upflag=1:dir
     ection=4:GOSUB 1400:GOTO 1280
1240 IF NOT INKEY(71) AND fuel>0  THEN e
     ngines=engines*-1:GOSUB 4380:RETURN
1250 IF (NOT INKEY(liftj) OR NOT INKEY(l
     iftk)) AND screen[x,y+1]>0 AND scre
     en[x,y+1]<4 THEN grab=grab*-1:objec
     ttype=screen[x,y+1]:objx=x:objy=y+1
     :GOSUB 4380:RETURN
1260 IF NOT INKEY(61) THEN GOSUB 3960:RE
     TURN
1270 RETURN
1280 IF grab=-1 THEN RETURN
1290 IF direction<>2 THEN objvel=0:GOSUB
      1980:RETURN
1300 GOSUB 1980:RETURN
1310 REM
1320 REM **** ship draw *****
1330 LOCATE x-1,y:PRINT CHR$(252)+CHR$(2
     53)+CHR$(254);
1340 RETURN
1350 REM
1360 REM **** ship delete *****
1370 LOCATE x-1,y:PRINT"   ";
1380 RETURN
1390 REM
1400 REM ***** ship move ******
1410 PEN 3:GOSUB 1360
1420 ON direction GOTO 1430,1450,1470,14
     90
1430 IF screen[x-1,y-1]>0 OR screen[x,y-
     1]>0 OR screen[x+1,y-1]>0 THEN 1520
1440 y=y-1:GOTO 1510
1450 IF screen[x-1,y+1]>0 OR screen[x,y+
     1]>0 OR screen[x+1,y+1]>0 THEN 1520
1460 y=y+1:GOTO 1510
1470 IF screen[x-2,y]>0 THEN 1520
1480 x=x-1:GOTO 1510
1490 IF screen[x+2,y]>0 THEN 1520
1500 x=x+1
1510 GOSUB 1320:RETURN
1520 shipend=1:RETURN
```

```
1530 REM
1540 REM ****** panel update ******
1550 PEN 1
1560 IF fueling=0 THEN GOSUB 3040:REM fuel gauge emptying
1570 LOCATE 17,1:IF engines=1 THEN PRINT CHR$(143); ELSE PRINT" ";
1580 LOCATE 25,1:IF grab=1 THEN PRINT CHR$(143); ELSE PRINT" ";
1590 IF ctime=99 THEN yellow=1
1600 IF ctime=49 THEN yellow=0:orange=1
1610 LOCATE 33,1
1620 IF ctime<50 THEN PEN 3:PRINT CHR$(143);:GOTO 1640
1630 IF ctime<100 THEN PEN 1:PRINT CHR$(143); ELSE PRINT" ";
1640 RETURN
1650 REM
1660 REM ****** ship fall ******
1670 PEN 3:IF grab=1 THEN 1700
1680 IF screen[x-1,y+1]>0 OR screen[x,y+1]>0 OR screen[x+1,y+1]>0 THEN IF velocity>maxvel THEN 1790 ELSE RETURN
1690 GOSUB 1360:y=y+1:GOSUB 1320:velocity=velocity+1:RETURN
1700 ON objecttype GOTO 1710,1750,1710
1710 IF screen[x-1,y+1]>0 OR screen[x,y+2]>0 OR screen[x+1,y+1]>0 THEN IF velocity>maxvel THEN 1790 ELSE RETURN
1720 GOSUB 1360:y=y+1:GOSUB 1320:velocity=velocity+1:screen[objx,objy]=0:objy=objy+1
1730 IF objecttype=1 THEN GOSUB 2270 ELSE GOSUB 2460
1740 RETURN
1750 IF screen[x-1,y+2]>0 OR screen[x,y+2]>0 OR screen[x+1,y+2]>0 THEN IF velocity>maxvel THEN 1790 ELSE RETURN
1760 GOSUB 1360:y=y+1:GOSUB 1320:velocity=velocity+1
1770 FOR i=objx-1 TO objx+1:screen[i,objy]=0:NEXT i
1780 objy=objy+1:GOSUB 2350:RETURN
1790 shipend=1:RETURN
1800 REM
1810 REM ***** explosion *****
1820 PEN 3:engines=-1
1830 IF xe<4 THEN xe=4
1840 IF xe>37 THEN xe=37
1850 FOR i=1 TO 3:FOR j=ye-1 TO ye+1
1860 LOCATE xe-3,j:PRINT SPACE$(7);
1870 FOR d=1 TO 100:NEXT d
1880 SOUND 1,200,5,15,0,0,15
1890 LOCATE xe-3,j:PRINT".:::::.";
1900 NEXT j:NEXT i
1910 FOR j=ye-1 TO ye+1
1920 LOCATE xe-3,j:PRINT SPACE$(7);
1930 screen[xe-3,j]=0:screen[xe-2,j]=0:screen[xe-1,j]=0:screen[xe,j]=0:screen[xe+1,j]=0:screen[xe+2,j]=0:screen[xe+3,j]=0
1940 NEXT j
1950 engines=-1:yellow=0:orange=0
1960 RETURN
1970 REM
1980 REM **** object move ****
1990 IF objecttype=3 THEN PEN 3 ELSE PEN 2
2000 ON objecttype GOTO 2010,2100,2010
2010 GOSUB 2310:ON direction GOTO 2020,2030,2050,2060
2020 objy=objy-1:GOTO 2040
2030 objy=objy+1
2040 IF objecttype=1 THEN GOSUB 2270:RETURN ELSE GOSUB 2460:RETURN
2050 objx=objx-1:GOTO 2070
2060 objx=objx+1
2070 LOCATE objx,objy:IF objecttype=1 THEN PRINT CHR$(g2); ELSE PRINT CHR$(g3);
2080 IF screen[objx,objy]>0 THEN shipend=1
2090 screen[objx,objy]=objecttype:RETURN
2100 GOSUB 2410:ON direction GOTO 2110,2120,2130,2140
2110 objy=objy-1:GOTO 2150
2120 objy=objy+1:GOTO 2150
2130 objx=objx-1:IF screen[objx-1,objy]>0 THEN shipend=1:GOTO 2150 ELSE 2150
2140 objx=objx+1:IF screen[objx+1,objy]>0 THEN shipend=1
2150 GOSUB 2350:RETURN
2160 REM
2170 REM ***** object fall *****
2180 PEN 2:ON objecttype GOTO 2190,2230,2190
2190 IF objvel>maxvel AND screen[objx,objy+1]>0 THEN 2250
2200 IF screen[objx,objy+1]>0 THEN RETURN ELSE GOSUB 2310
2210 objy=objy+1:IF objecttype=1 THEN GOSUB 2270 ELSE GOSUB 2460
2220 objvel=objvel+1:RETURN
2230 IF screen[objx-1,objy+1]>0 OR screen[objx,objy+1]>0 OR screen[objx+1,objy+1]>0 THEN IF objvel>maxvel THEN 2250 ELSE RETURN
2240 GOSUB 2410:objy=objy+1:GOSUB 2350:objvel=objvel+1:RETURN
2250 SOUND 1,200,100,15,0,0,15:xe=objx:ye=objy:GOSUB 1810:shipend=1:objectexplode=1:RETURN
2260 REM
2270 REM ***** object 1 draw ****
2280 PEN 2:LOCATE objx,objy:PRINT CHR$(g2);:screen[objx,objy]=1
2290 RETURN
2300 REM
2310 REM ***** object 1 & 3 delete *****
2320 LOCATE objx,objy:PRINT" ";:screen[objx,objy]=0
2330 RETURN
2340 REM
2350 REM **** object 2 draw *******
2360 PEN 2:LOCATE objx-1,objy:PRINT CHR$(127)+CHR$(233)+CHR$(127);
2370 FOR io=objx-1 TO objx+1:screen[io,objy]=rock:NEXT io
2380 screen[objx,objy]=2
2390 RETURN
2400 REM
2410 REM **** object 2 delete *****
2420 LOCATE objx-1,objy:PRINT SPACE$(3);
2430 FOR i=objx-1 TO objx+1:screen[i,objy]=0:NEXT i
2440 RETURN
2450 REM
2460 REM **** object 3 draw ****
2470 PEN 3:LOCATE objx,objy:PRINT CHR$(g3);:screen[objx,objy]=3
2480 RETURN
2490 REM
2500 REM ***** display plans ****
2510 CLS:GOSUB 4060:PEN 2
2520 LOCATE 6,24:PRINT CHR$(g2)+"  "+CHR$(g2)+"  "+CHR$(g2);
2530 LOCATE 6,23:PRINT CHR$(127)+CHR$(233)+CHR$(127)+CHR$(g2)+CHR$(127)+CHR$(233)+CHR$(127);
2540 FOR j=22 TO 8 STEP -2
2550 LOCATE 9,j:PRINT CHR$(g2);
2560 LOCATE 8,j-1:PRINT CHR$(127)+CHR$(233)+CHR$(127);
2570 NEXT j
2580 LOCATE 20,16:PRINT CHR$(127)+CHR$(233)+CHR$(127);
2590 PEN 3
2600 FOR i=20 TO 28 STEP 2:LOCATE i,24:PRINT CHR$(g3);:NEXT i
2610 LOCATE 28,23:PRINT CHR$(g3);
2620 LOCATE 20,15:PRINT CHR$(252)+CHR$(253)+CHR$(254);
2630 PEN 1
2640 LOCATE 30,22:PRINT" ";
2650 LOCATE 1,1:PRINT"press space bar to continue"
2660 LOCATE 20,4:PRINT"FUEL BASE-------";
2670 LOCATE 21,22:PRINT"BUNKER";
2680 LOCATE 29,23:PRINT"----STORES";
2690 LOCATE 11,11:PRINT"------TOWER";
2700 IF INKEY(47) THEN 2700
2710 GOSUB 2740
2720 RETURN
2730 REM
2740 REM ***** regenerate screen ******
2750 CLS:GOSUB 4060:REM scene set up
2760 GOSUB 3200:REM panel set up
2770 GOSUB 1540:REM panel display
2780 FOR i=1 TO 40:FOR j=2 TO 25
2790 ON screen[i,j] GOTO 2810,2820,2830
2800 GOTO 2840
2810 PEN 2:LOCATE i,j:PRINT CHR$(g2);:GOTO 2840
2820 oxt=objx:oyt=objy:objx=i:objy=j:GOSUB 2350:objx=oxt:objy=oyt:GOTO 2840
2830 PEN 3:LOCATE i,j:PRINT CHR$(g3);
2840 NEXT j:NEXT i
2850 PEN 3:GOSUB 1320
2860 RETURN
2870 REM
2880 REM *** engine sound sub ******
2890 IF engines=1 THEN SOUND 2,tone,50,4
2900 IF yellow=0 AND orange=0 THEN RETURN
2910 IF alarmdelay>0 THEN alarmdelay=alarmdelay-1:RETURN ELSE alarmdelay=3
2920 IF yellow=1 THEN SOUND 4,400,50,12:SOUND 4,300,50,12 ELSE SOUND 4,200,50,13:SOUND 4,100,50,12
2930 RETURN
2940 REM
2950 REM ***** refueling *****
2960 IF fuel<maxfuel THEN fuel=fuel+100 ELSE SOUND 1,150,5,13
2970 GOSUB 3000
2980 RETURN
2990 REM
3000 REM **** fuel gauge filling *****
3010 PEN 1:LOCATE 7,1:PRINT STRING$(INT(fuel*5/maxfuel),CHR$(154));
3020 RETURN
3030 REM
3040 REM **** fuel gauge emptying *****
3050 PEN 1:LOCATE 7,1
3060 IF fuel=0 THEN PRINT SPACE$(5);:GOTO 3180
3070 ON fuel/maxfuel*10 GOTO 3080,3090,3100,3110,3120,3130,3140,3150,3160,3170
3080 PRINT CHR$(255)+SPACE$(4);:GOTO 3180
3090 PRINT CHR$(154)+SPACE$(4);:GOTO 3180
3100 PRINT CHR$(154)+CHR$(255)+SPACE$(3);:GOTO 3180
3110 PRINT STRING$(2,CHR$(154))+SPACE$(3);:GOTO 3180
3120 PRINT STRING$(2,CHR$(154))+CHR$(255)+SPACE$(2);:GOTO 3180
```

```
3130 PRINT STRING$(3,CHR$(154))+SPACE$(2);:GOTO 3180
3140 PRINT STRING$(3,CHR$(154))+CHR$(255)+SPACE$(1);:GOTO 3180
3150 PRINT STRING$(4,CHR$(154))+SPACE$(1);:GOTO 3180
3160 PRINT STRING$(4,CHR$(154))+CHR$(255);:GOTO 3180
3170 PRINT STRING$(5,CHR$(154));
3180 RETURN
3190 REM
3200 REM ***** panel set up *****
3210 PEN 2:LOCATE 2,1:PRINT"FUEL";
3220 LOCATE 13,1:PRINT"ENG";
3230 LOCATE 19,1:PRINT"GRABS";
3240 LOCATE 27,1:PRINT"ALARM";
3250 RETURN
3260 REM
3270 REM *** stranded delay ****
3280 IF timestrand>0 THEN timestrand=timestrand-1 ELSE done=1
3290 RETURN
3300 REM
3310 REM ***** display scores ********
3320 CLS:CALL &BB03
3330 INPUT "what is your name ";name$:name$=LEFT$(name$,9):CLS
3340 FOR i=10 TO 1 STEP -1
3350 IF scoret[i] > score THEN NEXT i:GOTO 3410
3360 FOR j=i TO 1 STEP -1
3370 tempscore=scoret[j]:tempname$=namet$[j]
3380 scoret[j]=score:namet$[j]=name$
3390 score=tempscore:name$=tempname$
3400 NEXT j
3410 PRINT" name"SPACE$(7);"score":PRINT
3420 FOR i=10 TO 1 STEP -1
3430 PRINT " ";namet$[i],scoret[i]
3440 NEXT i
3450 GOSUB 4420
3460 RETURN
3470 REM
3480 REM ******* scoring *********
3490 PEN 1:FOR i=19 TO 29:FOR j=21 TO 24
3500 IF screen[i,j]=3 THEN score=score+10
3510 NEXT j:NEXT i
3520 CLS:PRINT"For moving stores you scored   ";score:PRINT
3530 FOR i=6 TO 12 STEP 3
3540 IF screen[i,24]=1 THEN score2=score2+2
3550 NEXT i
3560 IF score2<6 THEN score1=score2:GOTO 3670 ELSE score1=score1+score2:score2=0
3570 FOR i=6 TO 10 STEP 4
3580 IF screen[i,23]=14 AND screen[i+1,23]=2 AND screen[i+2,23]=14 THEN score2=score2+6
3590 NEXT i
3600 score1=score1+score2:IF score2<12 THEN 3670 ELSE scoref=1
3610 IF screen[9,23]=1 THEN score1=score1+2 ELSE 3670
3620 IF scoref=0 THEN 3670
3630 FOR j=22 TO 8 STEP -2
3640 IF screen[9,j]=1 THEN score1=score1+2 ELSE 3670
3650 IF screen[8,j-1]=14 AND screen[9,j-1]=2 AND screen[10,j-1]=14 THEN score1=score1+6 ELSE 3670
3660 NEXT j
3670 score=score+score1
3680 PRINT"For work on tower you scored   ";score1:PRINT
3690 IF score1=84 THEN PRINT"For finishing tower you scored  300":PRINT:score=score+300
3700 IF shipend=1 THEN PRINT"For destroying ship you scored  0" ELSE score=score+100:PRINT"For saving ship you scored";SPACE$(6);"100"
3710 PRINT:PRINT:PRINT"Your total score is";SPACE$(12);score
3720 GOSUB 4420
3730 RETURN
3740 REM
3750 REM ******* ship destroyed ******
3760 xe=x:ye=y:GOSUB 1810:GOSUB 4460:CLS:PEN 1
3770 IF fuel=0 THEN PRINT" Your ship ran out of fuel and then":PRINT:PRINT"crashed.":RETURN
3780 IF objectexplode=1 THEN PRINT"You dropped an object, it exploded and":PRINT:PRINT"the radiation destroyed your ship.":RETURN
3790 PRINT"You crashed your ship."
3800 RETURN
3810 REM
3820 REM ****** ship safe ******
3830 PEN 1:IF x<19 OR x>28 OR y<21 THEN outside=1:GOTO 3910
3840 FOR i=17 TO 30
3850 IF screen[i,20]<rock OR screen[i,25]<rock THEN 3910
3860 NEXT i
3870 FOR j=20 TO 25
3880 IF screen[17,j]<rock OR screen[30,j]<rock THEN 3910
3890 NEXT j
3900 IF count=0 THEN CLS:PRINT"Congratulations your ship survived the":PRINT:PRINT"solar flares.":RETURN ELSE RETURN
3910 shipend=1:xe=x:ye=y:GOSUB 1810:CLS:PEN 1
3920 IF outside=1 THEN PRINT "Your ship was caught outside the bunker":PRINT:PRINT"when the solar flare occurred and so was":PRINT"destroyed.":RETURN
3930 PRINT"The bunker door was open when the solar":PRINT:PRINT"flare occurred and so your ship was":PRINT:PRINT"destroyed."
3940 RETURN
3950 REM
3960 REM ***** door ******
3970 IF door=1 THEN 4000
3980 IF y<22 OR y>23 OR x<29 OR x>31 THEN IF screen[30,22]=0 AND screen[30,23]=0 THEN 4000
3990 RETURN
4000 GOSUB 4380:door=door*-1
4010 IF door=1 THEN fills=143:filla=14 ELSE fills=32:filla=0
4020 screen[30,22]=filla:screen[30,23]=filla
4030 PEN 1:LOCATE 30,22:PRINT CHR$(fills);:LOCATE 30,23:PRINT CHR$(fills);
4040 RETURN
4050 REM
4060 REM ***** scene set up *******
4070 PEN 1
4080 FOR i=1 TO 40:screen[i,1]=rock:screen[i,25]=rock:LOCATE i,25:PRINT CHR$(g1);:NEXT i
4090 FOR j=15 TO 25:screen[1,j]=rock:LOCATE 1,j:PRINT CHR$(g1);:NEXT j
4100 FOR i=2 TO 25:screen[1,i]=rock:screen[40,i]=rock:LOCATE 40,i:PRINT CHR$(g1);:NEXT i
4110 FOR i=36 TO 39:FOR j=2 TO 15:screen[i,j]=rock:LOCATE i,j:PRINT CHR$(g1);:NEXT j:NEXT i
4120 FOR i=27 TO 32:FOR j=6 TO 20:screen[i,j]=rock:LOCATE i,j:PRINT CHR$(g1);:NEXT j:NEXT i
4130 FOR j=16 TO 18:LOCATE 32,j:PRINT CHR$(32);:screen[32,j]=0:NEXT j
4140 LOCATE 33,19:PRINT CHR$(g1)+CHR$(g1)+CHR$(g1);:screen[33,19]=rock:screen[34,19]=rock:screen[35,19]=rock:screen[30,22]=0:screen[30,23]=0
4150 FOR j=8 TO 24:LOCATE 2,j:PRINT CHR$(g1);:screen[2,j]=rock:NEXT j
4160 LOCATE 16,24:PRINT CHR$(g1);:screen[16,24]=rock
4170 FOR j=19 TO 24:LOCATE 17,j:PRINT CHR$(g1);:screen[17,j]=rock:NEXT j
4180 LOCATE 17,18:PRINT CHR$(223);:screen[17,18]=rock
4190 FOR i=18 TO 26:LOCATE i,20:PRINT CHR$(g1);:screen[i,20]=rock:NEXT i
4200 LOCATE 18,21:PRINT CHR$(220);:screen[18,21]=rock
4210 LOCATE 18,19:PRINT CHR$(223);:screen[18,19]=rock
4220 LOCATE 26,19:PRINT CHR$(222);:screen[26,19]=rock
4230 LOCATE 15,24:PRINT CHR$(222);:screen[15,24]=rock
4240 LOCATE 16,23:PRINT CHR$(222);:screen[16,23]=rock
4250 LOCATE 18,24:PRINT CHR$(223);:screen[18,24]=rock
4260 LOCATE 30,21:PRINT CHR$(g1);:screen[30,21]=rock
4270 LOCATE 29,21:PRINT CHR$(221);:screen[29,21]=rock
4280 LOCATE 29,24:PRINT CHR$(222);:screen[29,24]=rock
4290 LOCATE 30,24:PRINT CHR$(g1);:screen[30,24]=rock
4300 LOCATE 6,25:PRINT CHR$(143);:LOCATE 9,25:PRINT CHR$(143);:LOCATE 12,25:PRINT CHR$(143);
4310 IF door=1 THEN PEN 1:door=-1:GOSUB 3960
4320 PEN 3
4330 FOR i=36 TO 39:LOCATE i,3:PRINT" ";:screen[i,3]=0:NEXT i
4340 LOCATE 36,4:PRINT CHR$(143)+CHR$(233)+CHR$(143);
4350 FOR i=36 TO 38:screen[i,4]=13:NEXT i:screen [37,4]=12:LOCATE 39,4:PRINT" ";:screen[39,4]=12
4360 RETURN
4370 REM
4380 REM ******* delay *******
4390 FOR del=1 TO 50:NEXT del:SOUND 1,200,10,13
4400 RETURN
4410 REM
4420 REM **** space bar ****
4430 LOCATE 1,25:PRINT"Press space bar to continue"
4440 IF INKEY(47) THEN 4440 ELSE CLS:RETURN
4450 REM
4460 REM ***** shut down *****
4470 engines=-1:yellow=0:orange=0
4480 RETURN
```

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'SUPERPOWER' SIDEWAYS ROMCARD FOR THE AMSTRAD

This unit opens up a whole new field of personal computing, previously only available to owners of the BBC Micro and other top of the range computers.
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Until 30th June the SUPERPOWER ROMCARD will only be available by Mail Order. We are giving away a 16K Eprom (worth over £10) with all orders received by that date. Moreover, this will contain a FREE copy of Micro Power's highly acclaimed 'Ghouls' program to demonstrate the instant nature of Rom-based Software.



SUPERPOWER SIDEWAYS ROMCARD (Ref A101) £39.95.

'SUPERPOWER' ROM BASED SOFTWARE

A complete range of Rom-based programs is under development, releases being planned at the rate of two per month, starting in June.
Available from June 1st are the Mailing List/Club Membership program plus the Disk User's Utilities Rom.
Later releases will include Word Processor, Spreadsheet, Database and Graphics/Printer routines packages – with data interchange facilities – PLUS an Enhanced Basic/Toolkit program and a Machine-Code Monitor.

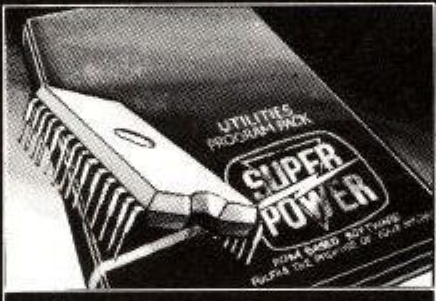


SUPERPOWER MAILING LIST and club membership PROGRAM (Ref A102) £39.95.

'SUPERPOWER' MAILING LIST (AND CLUB MEMBERSHIP) PROGRAM (REF A102)

The program handles very large lists of names and addresses on a selective basis, acts as a simple Database, and is particularly suitable for Club Membership records. The main features are as follows:- Each Record can contain up to 19 fields, those to appear on labels being user-selected. Variable length fields are used to optimise memory and disk space.
In practice, approximately 2000 records containing name and address and two non-label fields can be held on one side of a disk. Multiple double-sided disks are catered for. Each record can have up to 20 classification indicators. When used as Membership List, 12 can be nominated for monthly subscription reminders.

A screen report gives breakdown by categories. Printing options include Label fields only, and Total Record including classifications. Label can be of two standard sizes or user-defined. Program works with any parallel printer.
Alphabetical Order is dealt with on Entry. User choice of Keyword e.g. 'J' ohn or 'S' mith.
The Name field can be searched for the first part or the whole of a keyword. The whole file can also be searched for any string. There is sophisticated line and character editing, including change of keyword. Function Keys can be defined to give single key entry of commonly used string e.g. 'Membership No.' In Entry mode an automatically incrementing number is available. Foreground and Background colours can be selected.



SUPERPOWER DISK USER'S UTILITIES ROM (Ref A103) £39.95.

'SUPERPOWER' DISK USER'S UTILITIES ROM (REF A103)

This program allows detailed inspection and modification of information held on disk. It is of particular use in the recovery of data from corrupted disks. Individual sectors can be read from and written to. All data can be output to the screen and/or printer. The program also contains a number of functions of use to the assembly language programmer.
Main Functions.
FILELOAD – loads first sector into buffer and remainder into memory for fast access later.
READ – reads a sector into the buffer and enters Edit Mode.

EDIT – displays the current buffer. Data displayed is Buffer Address, Hexadecimal representation of each byte and ASCII representation of each byte.
Depending on mode selected, display is of 12 or 24 lines of 8 or 16 bytes.
– modification of Hex numbers, changing the ASCII automatically and vice versa.
– comprehensive cursor controls for easy editing.
FIND – can search a sector or total file for an ASCII string.
WRITE – writes a sector previously read by READ or FILELOAD.

SUBSIDIARY FUNCTIONS –
CATALOGUE – similar to AMSDOS catalogue.
MODE – Select 40 col./12 line display or 80/12, 40/24 or 80/24.
INK – Select Background and Foreground Colours.
ROM CHECK – lists all sideways Roms, giving Position, Foreground or Background, Name, Version No. etc.
OTHER DISK COMMANDS – Access to other commands such as Format and Verify is provided directly from the Rom.
ASSEMBLY PROGRAMMER'S AIDS.
Disassembler. Relative Jump Calculator. Calculate the Sum and Difference of two hex numbers. Hex to Decimal Conversions – and vice versa. Intelligent Copy.

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Writing Adventures PART IV

What I have been trying to give you over the last three issues is the core of an operating system for an adventure game. Part 1 described how to map out 'your' adventure game's locations and how to add objects to this world and so create the beginnings of the puzzles so very necessary to an adventure.

Part 3, last month, gave you a system where you - and the eventual player -will be able to issue commands to the computer. The system given was a compromise between the rudimentary VERB/NOUN only inputs found on the original adventure games and the highly sophisticated routines available on a few of the latest games.

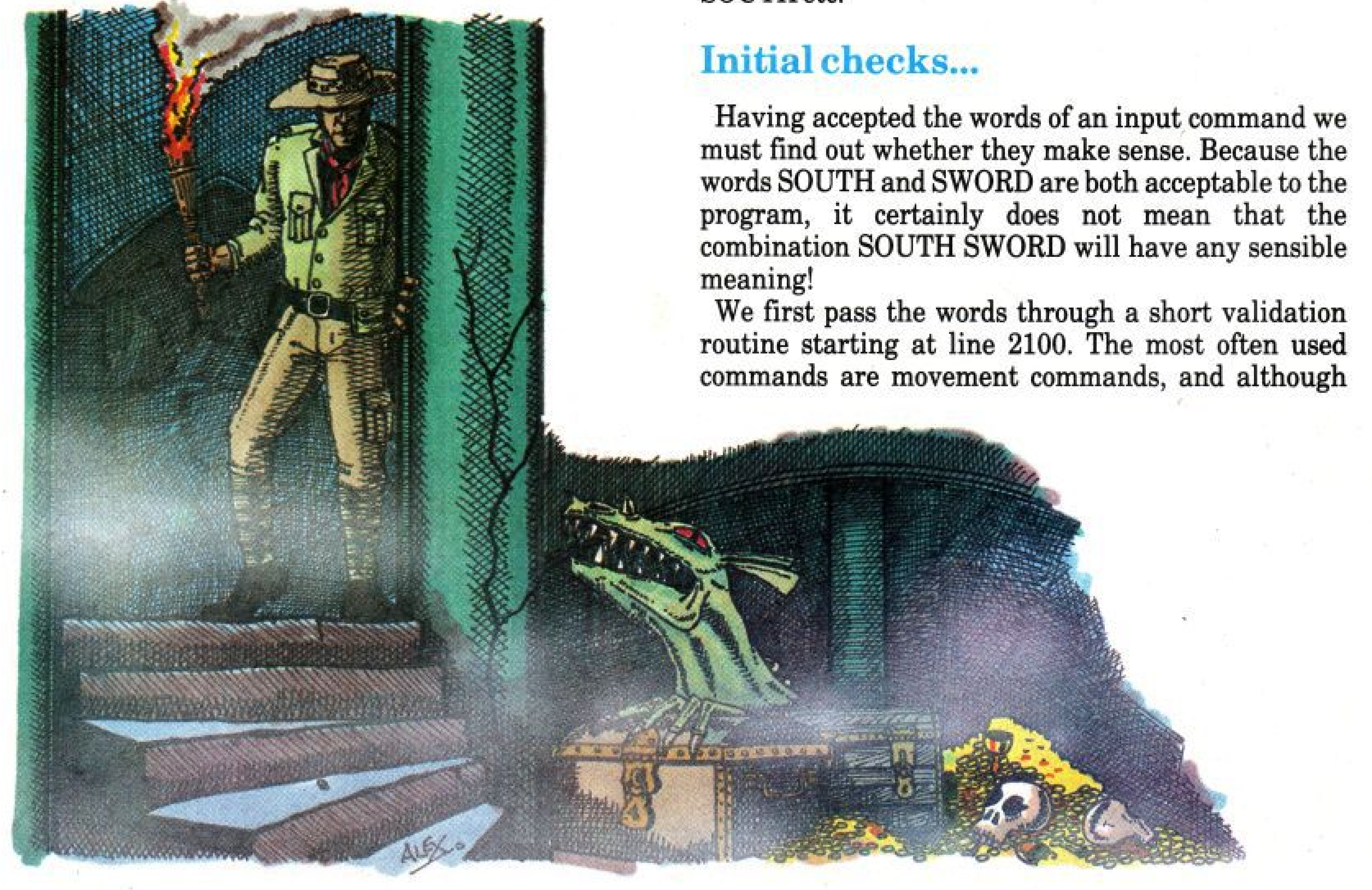
I have stressed the importance of writing down on paper, full and detailed lists of all the words that you wish the program to recognise. This month you will begin to understand why. Writing an adventure game is enormous fun (even more so when you have completed it) but it is not to be entered into lightly nor without adequate preparation. This month we will see just how good your preparation has been.

The command routine is only a development of the more simple system; mainly with user friendliness in mind rather than offering a command structure that will act on complex sentences. Whilst the later may seem a goal to aim for, it has many serious drawbacks, both in memory requirements and speed of response when written in BASIC.

The system used so far, has been for you to stick to the line numbers given in the articles, with occasional updates as may have been necessary as the program developed. That still applies to much of this and future articles, but this month, we will reach some areas that will be unique to 'your adventure' and so you may have to use my line numbering more as a guide than a command.

We finished up last month with routines that would enable the computer to recognise up to a three word input command. This thoughtfully ignored such 'linking words' as THE, A and TO, or of course any other words you felt should be treated in this way (line 1625).

Having analysed the input and given each word a unique 'number' we now have to begin actioning the command. Although we have permitted the input of VERB-MODIFIER-OBJECT, we can accept a range of single word commands and generally operate on just the verb and object. The modifier (adjective or adverb) will for the most part be ignored. Its inclusion is to enhance the appearance of the inputs accepted (user friendliness!) and occasionally to add variety to the puzzles - GET LARGE KEY or RUN QUIETLY SOUTH etc.



Initial checks...

Having accepted the words of an input command we must find out whether they make sense. Because the words SOUTH and SWORD are both acceptable to the program, it certainly does not mean that the combination SOUTH SWORD will have any sensible meaning!

We first pass the words through a short validation routine starting at line 2100. The most often used commands are movement commands, and although

we have already sifted out the single key and single word commands we must still allow for people that are in the habit of typing GO EAST etc.

```
268 REM ** LIST - 23
269 REM ** Verb and Object synonims
270 RESTORE 13000
275 FOR I%=1 TO 16:REM ** Number of verb
synonims
280 READ SV%(I%):NEXT I%
285 FOR I%=1 TO 13:REM ** Number of obje
ct synonims
290 READ SN%(I%):NEXT I%
2099 REM ** Validate
2100 IF (V%=34 OR V%=76 OR V%=62) AND N%
>108 THEN Q$(1)=LEFT$(W$(3),1):GOTO
2000
2105 IF N%>85 AND N%<99 THEN N%=SN%(N%-8
5)
2110 IF V%>60 THEN V%=SV%(V%-60)
2115 REM
2120 REM
2125 IF N%=33 AND (A%=16 OR A%=17) THEN
N%=10 ELSE IF N%=33 AND (A%=10 OR A
%=26) THEN N%=31 ELSE IF N%=33 THEN
CLS #3:LOCATE #3,2,2:PRINT #3,"A k
ey is a key is a key...":GOTO 960
2130 REM
2135 REM
2140 IF N%<32 THEN IF (OP%(N%)<>L% AND O
P%(N%)<>0 AND OP%(N%)<>-1) OR OC%(N
%)>4 THEN CLS #3:LOCATE #3,2,2:PRIN
T #3,"Can see nothing like that her
e...":GOTO 960
2145 REM
2150 REM
2155 CLS #2:LOCATE #2,2,2
2160 IF V%>41 THEN 2210 ELSE 2200
2199 REM ** Direction to Verb routines
2200 ON V%-15 GOTO 5600,5700,5800,5900,6
000,6100,6200,6300,6400,6500,6600,6
700,6800,6900,7000,7100,7200,7300,7
400,7500,7600,7700,7800,7900,8000
2210 ON V%-40 GOTO 8100,8200,8300,8400,8
500,8600,8700,8800,8900,9000,9100,9
200,9300,9400,9500,9600,9700,9800,9
850
12999 REM ** Synonim data
13000 DATA 24,34,16,16,35,33,43,27,29,51
,16,16,32,48,55,34
13010 DATA 22,16,16,12,33,52,28,11,29,13
,26,25,25
```

Line 2100 looks to see if GO, WALK or ENTER (V%=34 etc.) have been used in combination with a word from our object list having a number above 108 (N, E, U, NORTH etc). If this is the case then the first letter of the object word is stripped off and the program directed to the single letter routine at line 2000.

Lines 2105, 2110 check to see if the object or verb numbers represent synonyms (remember we put all synonyms in separate blocks within our verb and object lists). If the number represents a synonym then N% or / and V% is reassigned the number of the prime word by using arrays SN%() and SV%(). These arrays were filled with the appropriate numbers in the routines at lines 270 - 290, using the data held at lines 13000 and 13010.

Line 2125 looks to see if the object KEY (N%=33) has been entered, if it has been used with an acceptable modifier (LARGE, IRON, SMALL or CURIOUS) then the program knows which key is meant, and reassigns N% with the correct number (10 or 31). If an unacceptable modifier has been used then a nonsense/hint message is printed in window 3 and the program returns via a delay (line 960) to the input request at line 1500.

The REMs at lines either side of line 2125 are left in case 'you' have other special conditions to be checked before the program continues.

Line 2140 checks to see if an object is either at that location (L%), is in the player's possession (OP$()=0), is worn (OP%()=-1), or is visible (OC%() less than 4). If none of these condition are met then an appropriate message is printed in window 3.

Note that this is the same message as one of those that is displayed if the object word is not understood at all (lines 640-650). This is on purpose, so as not to give away the fact that the word has been recognised.

These conditions having been met, some response will have to be made. To prepare for this, line 2155 clears window 2 and determines that printing will appear on the second line down (LOCATE #3,2,2).

Note that if a line of text extends past a full screen line then LOCATE only locates text vertically and does not locate text horizontally as you would expect. Hence the leading space incorporated in single lines of text.

Having completed our initial checks, the program is directed to the routines associated with the VERB entered in the input command - lines 2160, 2200 and 2210. The routines are split into two lines because there are too many of them to type onto one line.

In my program, there are 76 words recognised as verbs, but if you look back to last month's listings (lines 14000 and 14010), you will note that the first 15 are reserved for single word entries - hence the subtraction of 15 from V% in line 2200.

Action all the way...

Obviously the choice of verbs and their action within 'your' program may well be different from the way that I might use them. This is something that you will have to work out for yourself. What I can do is go through some of the more likely commands and hope that these examples will not only help you to understand my routines but will give you a working understanding of what to look and plan for in yours.

The most used command (after movement) is that for GETting or TAKEing something, so let us look at what this routine is likely to entail. GET is my 23rd word in the verb list and if you work from lines 2200 and 2210 you will find that this routine starts at line 7200. TAKE's synonym, is number 73 but has been changed to 32 in line 2110.

We start in line 7200 by deciding what objects may be got. The first 31 items of the object list may be taken, providing the conditions are right. Objects 76 and 77 (OIL and WATER) are treated as a special case.

```
654 REM ** LIST-24
655 PRINT #2,"WHAT! You_re joking...Thi
s is supposed to be a game of logic
and deduction... You are not on co
urse...":GOTO 1500
7199 REM ** Get,Take
7200 IF (N%>31 AND N%<74) OR N%>108 THEN
655
7205 REM
7210 REM
7215 IF N%=76 OR N%=77 THEN 9900
7220 IF N%=16 AND OP%(8)<>-1 THEN PRINT
#2,"The thorns have a poison that
proves deadly to humans...":GOTO
16000
7225 IF L%=13 AND F%(2)=0 THEN PRINT #2,
"The Troll will not let you take th
em!":GOTO 1500
7230 REM
7235 REM
7240 IF N%>98 THEN 7275
7245 IF OP%(N%)=0 OR OP%(N%)=-1 THEN PRI
NT #2,"You_ve already got THAT...":
GOTO 1500
7250 IF C%>4 THEN PRINT #2,"You are carr
ying all that you can...":GOTO 1500
7255 REM
7260 REM
7270 PRINT #2,"OK...Carried":OP%(N%)=0:C
%=C%+1:GOTO 1500
7275 PRINT #2,"":F%=0:FOR I%=1 TO 31:IF
C%>4 THEN I%=31:GOTO 7285
7280 IF OP%(I%)=L% AND OC%(I%)=1 THEN OP
%(I%)=0:C%=C%+1:PRINT #2,"OK...Car
ried":F%=F%+1
7285 NEXT I%:IF C%>4 THEN PRINT #2,"You
are carrying all that you can...":
GOTO 1500
7290 IF F%=0 THEN PRINT #2,"Seems to be
nothing there to take,":PRINT #2:P
RINT #2,"You may have to be more s
pecific!":GOTO 1500 ELSE GOTO 1500
```

The remaining object words that are understood (such as COURTYARD, RIVER, the object synonyms, and NORTH, SOUTH, etc.) are not items that one would expect to pick up. Even so, some people may still try to do so. For them we will provide a sharp reminder at line 655. This message will be used by nearly every routine in response to unwelcome or silly input commands.

Line 7215 reacts to OIL and WATER by sending program operation off to their own special sub-routine at line 9900.

Eventually we will probably allow the object chosen to be TAKEn but first we must check for any special cases.

Line 7220 checks to see if the adventurer is wanting to get the ROSE (N%=16) and if he is wearing the GLOVES (object 8), if not (OP%(8)<>-1), then poisoning and the death routine at line 16000 will ensue.

Line 7225 checks for the Troll's location (L%=13) and also to see if he is alive (flag F%(2)=0). If so, you are not permitted to take anything!

The REMs merely indicate where you may add further conditional lines of your own. Line 7240 looks for ALL and EVERYTHING and directs the program to this routine at line 7275.

Line 7245 checks to see if the players are asking for something they already have (or are wearing). Line 7250 ensures that only up to five items may be carried. A 'greater than' condition is used because this allows small items to be hidden inside others that may be picked up (discovered later) AND retained. If more than five items are already being carried, the program merely stops any more being taken.

Now that all the checks that we can think of have been applied, line 7270 transfers the object's location to that of the player (OP%(N%)=0) and increments the number of objects carried (C%).

Finally the routine for GET ALL from line 7275. A flag is set to count the number of items taken (F%). A FOR...NEXT loop cycles through all available objects to see if they are present, and if their 'Class' is 1, then providing the permissible number is not exceeded, they are then added to the player's possessions.

If F%=0 then a message is displayed saying that nothing has been taken, but with the rider that the player may have to be more specific. This is a simple, ambiguous way to cover situations where an object may be seen but not taken (i.e. where the object's Class is not 1: such as our poisonous rose!).

You don't know where it's been...

Having just picked something up, you may wish to put it down again. This is quite a short, simple routine with (in this example) no conditions set to prevent anything carried being put down.

```
6698 REM ** LIST-25
6699 REM ** Drop,Put
6700 IF (N%>31 AND N%<74) OR N%>108 THEN
655
6705 REM
```

```
6710 REM
6715 IF N%=76 OR N%=77 THEN 9900
6720 IF N%>98 THEN 6750
6725 IF OP%(N%)<>0 AND OP%(N%)<>-1 THEN
PRINT #2,"You cannot drop what you
don_t carry!":GOTO 1500
6730 REM
6740 REM
6745 PRINT #2,"OK...Dropped":OP%(N%)=L%:
C%=C%-1:GOTO 1500
6750 IF C%<1 THEN PRINT #2,"Nothing to d
rop...":GOTO 1500
6755 PRINT #2,"":FOR I%=1 TO 31
6760 IF OP%(I%)=0 OR OP%(I%)=-1 THEN OP%
(I%)=L%:C%=C%-1:PRINT #2,"OK...Dro
pped"
6765 NEXT I%:GOTO 1500
```

Line 6700 is our general reply to the silly command such as DROP WEST etc. Line 6715 again diverts OIL and WATER to their own sub-routine at 9900. Line 6720 redirects the program to line 6750 on the command DROP ALL.

Line 6725 checks to see if the player has actually got anything to drop. Again REM lines are there for any additional conditions that 'you' wish to set. Line 6745 carries out the command transferring the object's location, and decrementing the number of items carried.

Lines 6750-6765 utilise a FOR...NEXT loop to ascertain what is being carried and relocating all items carried to the present location.

Look around...

After GET the most used command is EXAMINE. This not only amplifies an object's or a place's description, but often alters the conditions of some items present.

The object list is compiled in such a manner as to make the condition of whether an object can be examined, easier to determine. Line 6900 prints our standard message (line 655) if something like EXAMINE SOUTH is entered.

Next those items in the first section of the object list (up to number 20) are dealt with in line 6902. These have no special significance when examined and a simple message is displayed.

```
659 REM ** LIST - 26
660 PRINT #2,"You_re wasting time, you
have already searched this place..
.":GOTO 1500
6899 REM ** Examine, Search
6900 IF N%>77 THEN 655
6902 REM
6904 REM
6906 IF N%<21 THEN PRINT #2,W$(3);"...EX
AMINED:-":PRINT #2:PRINT #2,"Nothi
ng special catches the eye":GOTO 15
00
6908 REM
6910 REM
6912 IF N%>60 AND N%<74 THEN PRINT #2,"I
have far-sight and hind-sight...":
PRINT #2:PRINT #2,"but, I see noth
ing!":GOTO 1500
6914 REM
6916 REM
6918 S%=N%-20
6920 ON S% GOTO 6922,6924,6926,6928,6930
,6932,6934,6936,6938,6940,6942,6944
,6946,6948,6950,6952,6954,6956,6958
,6960,6962,6964,6966,6968,6970,6972
,6974,6976,6978,6980,6982,6984,6986
,6988,6990,6992,6994,6996,6998
6940 IF F%(1)=1 THEN PRINT #2,"The burn
ished blade reveals a picture of
a dragon within a magical sphere...
":GOTO 1500 ELSE PRINT #2,"This fi
ne weapon has been left unused an
d untended for too long...":GOTO 15
00
6952 IF L%=24 OR L%=25 THEN PRINT #2,"T
he boat is long and black. There is
a man dressed in a black cloak wi
th a deep hood sitting quietly
alongside... perhaps he is the fer
ryman...":GOTO 1500 ELSE GOTO 665
6960 IF L%=4 AND OC%(30)=5 THEN PRINT #2
,"There is a pile of red cloth, un
der it it you see: a sword and a l
arge key!":OC%(10)=1:OC%(30)=1:GOTO
1500
6961 IF L%=4 GOTO 660 ELSE 665
6972 PRINT #2,"NYMPH":GOSUB 960
6992 PRINT #2,"WALL":GOTO 960
```

The next section to come under scrutiny are those objects that do not have any special significance and neither do they have any object description (data lines 12000-). This means that we have no way of easily checking that the object referred to is at that location. Hence the somewhat ambiguous but not unreasonable response in line 6904.

One mark of a good adventure game is its ability to apparently deal sensibly with awkward commands. If the response does not 'jar' on the player, you are half way there. Watch out for such responses - for instance, try not to give singular replies to plural questions.

An ON...GOTO command is used to direct the program to the right response for our chosen objects in line 6920. S% is adjusted in line 6918 so that object number 21 (the first 'examinable' object) will have its message at line 6922, the first of the ON...GOTO line numbers. Again the REM lines are for any additional conditions that 'you' may wish to set.

It is somewhat easy to get lost with all those line

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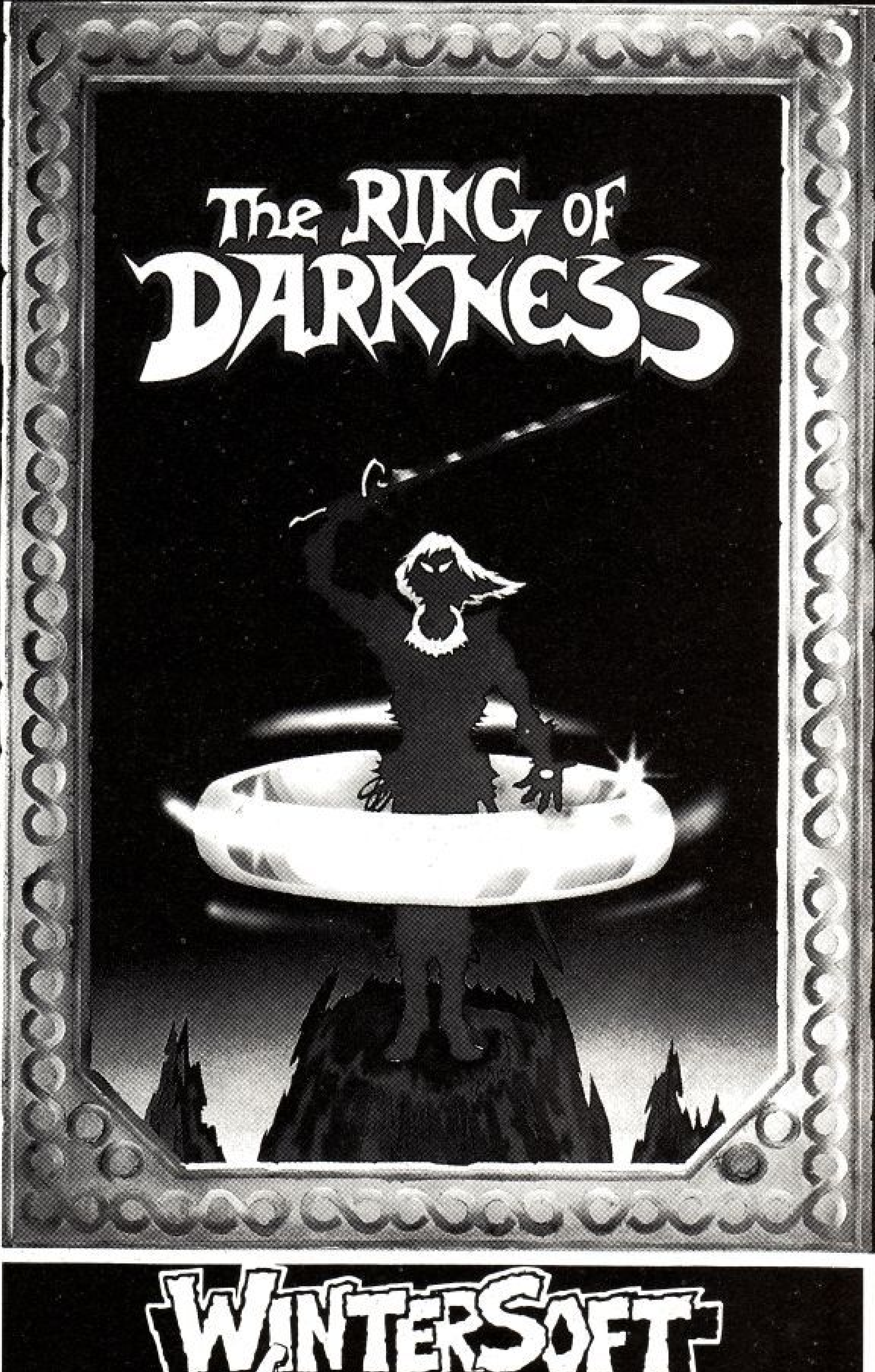
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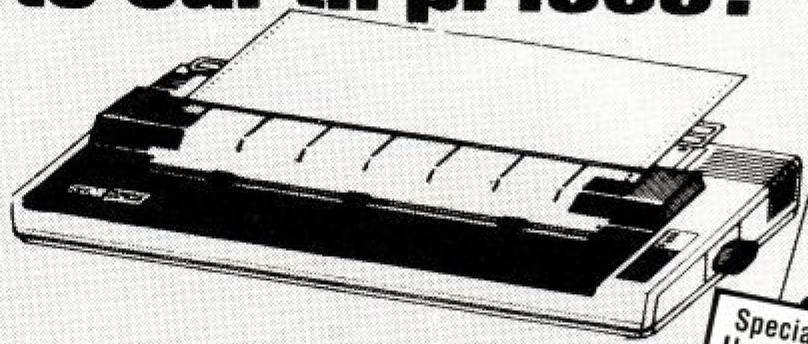
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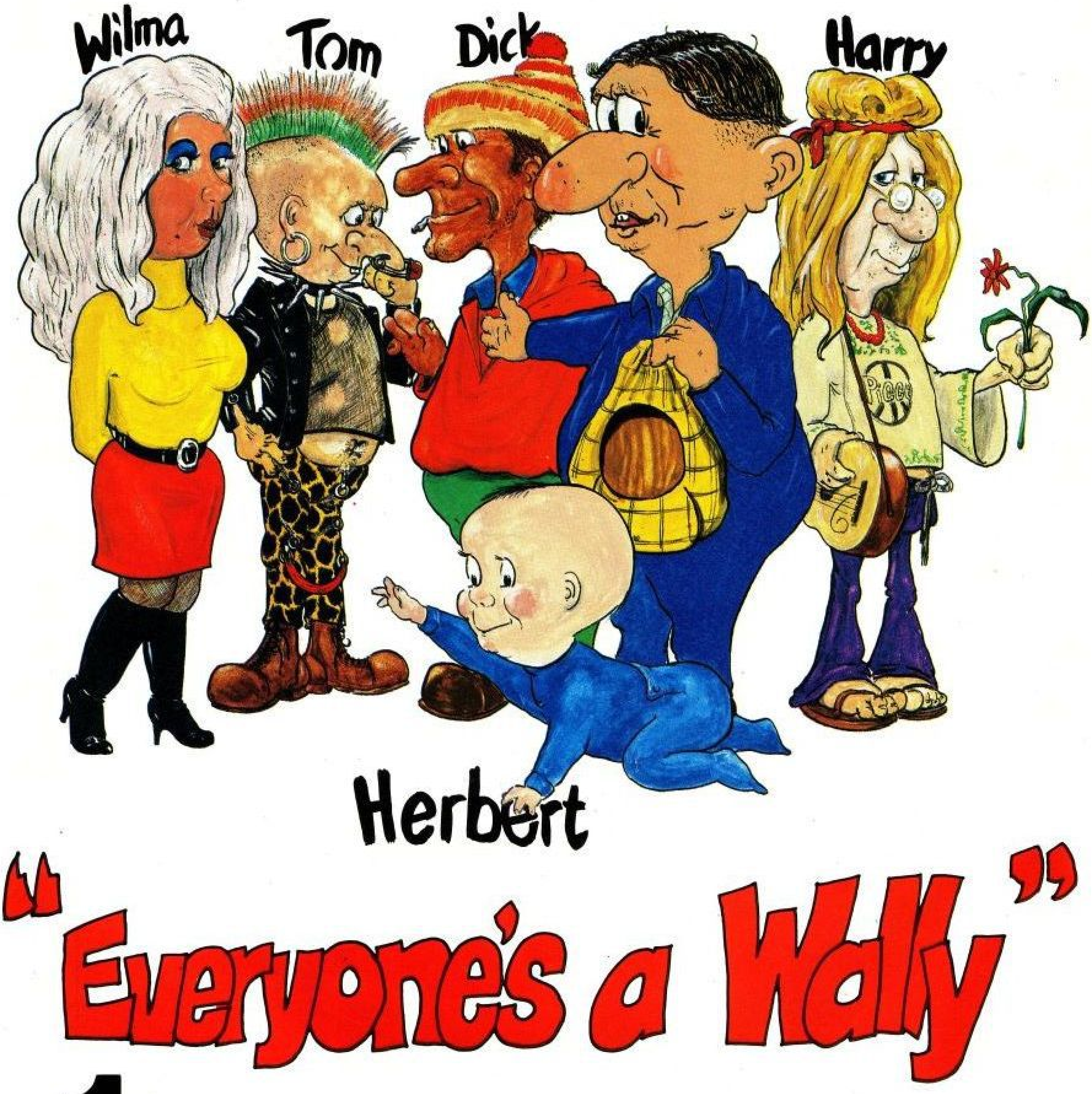


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numbers in line 6920, so I would draw your attention to lines 6972 and 6992. These are there so that I could verify that I would get the correct responses.

There are no conditions set in these two lines, so I only have to RUN the program and type in EXAMINE NYMPH or EXAMINE WALL. If the correct line numbers have been chosen, then an echo of what was typed in will appear on the screen. A similar system may be used to check the line numbers in 2200 and 2210.

Let us look at a few examples of the 'examine responses':

EXAMINE SWORD - line 6940, if the sword has been cleaned (F%(1)=1) then one message is given but if it has not, then the second message is displayed. There is no need to check if the sword is present as this was done in line 2140 above.

EXAMINE FERRYMAN - line 6952, checks to see if the player is at location 24 or 25 and if true, describes him. If not at these locations, our general purpose response at line 665 is used again. The check for the location is necessary because the ferryman is not part of our object data - he is only mentioned in the location description.

EXAMINE COUNTER - line 6960, checks to see if you are in the right location (L%=4) and also the 'Class' of object 30 (the sword). If the sword is still hidden (OC%(30)=5), then the sword and large key are revealed and their 'Classes' changed to 'visible' (OC%()=1).

The next time the counter is examined (people will you know.), then an 'already examined' message is displayed. Should anyone try to examine the counter in the wrong location, then neither message is displayed (L% is not equal to 4) but line 665 is used again.

These three examples show the three main ways of utilizing the EXAMINE command. It can simply give the same message again and again, either a hint to a puzzle or just a 'red herring' (the ferryman). It can change the status of objects either at that location or any other (the counter); or it can display a message dependent upon action taken other than the examining itself (the sword).

Stylish...

Another short routine for a command that often crops up is WEAR. This starts at line 9850 which checks to see if the item requested to be worn is 'wearable'. Object numbers 8,9,14 and 26 are the only ones permitted - any others (such as WEAR FLASK) get the 'silly' answer.

```
9848 REM ** LIST - 27
9849 REM ** Wear
9850 IF N%<>8 AND N%<>9 AND N%<>14 AND N
%<>26 THEN PRINT #2,"That would loo
k pretty silly...":GOTO 1500
9855 IF OP%(N%)>0 THEN PRINT #2,"You can
not wear what you have_nt got!":GOT
O 1500
9860 IF OP%(N%)=-1 THEN PRINT #2,"Forget
ful? - already worn!":GOTO 1500
9865 PRINT #2,"OK...Worn":OP%(N%)=-1
9870 REM
9875 REM
9880 REM
9885 GOTO 1500
```

Line 9855 checks to see whether the player has the object in his possession, and line 9860 checks whether it is already being worn! Line 9865 changes the 'Class' of the object to 'worn' (OC%(N%)=-1). The following REMs are there to allow room for additional action to be taken if something should happen when a particular object is worn. Control is returned to the input command request (line 1500) at the line 9890.

Finally...

Note the changes to lines 545 and 550 that now enable the inventory to indicate which items are worn. I have changed the response in line 1230 from 'Nothing obvious' to 'Nothing else'. This sounds logical following the location description in window 1 above and looks far better when it follows the 'more' display (when just enough objects are at a location NOT to actually show any MORE when the space key is pressed -line 1225).

Line 1600 corrects a mistake made in the listing last month; without A%=0, the program remembers the last modifier used. Lines 155 and 160 are updated with the new variables introduced this month.

```
154 REM ** LIST -28
155 DIM N(50),E(50),S(50),W(50),U(50),D(
50),OC%(31),OP%(31),SV%(16),SN%(13),
F%(10)
160 SCORE=0:L%=1:LC%=0:I%=0:X%=0:I=0:DL=
0:Y%=0:WC%=0:W%=0:V%=0:N%=0:A%=0:S%=
0:C%=2
545 IF OP%(I%)>0 OR OP%(I%)<-1 THEN 555
550 F%=F%+1:PRINT #2," ";OS$(I%);:IF OP%
(I%)=-1 THEN PRINT #2," (worn)" ELSE
PRINT #2,""
1230 NEXT I%:IF F%=0 THEN PRINT #2,"Not
hing else..."
1600 ERASE W$:Q$(1)=Q$(1)+" ":Y%=1:WC%=0
:V%=0:N%=0:A%=0
```

I hope that some of the readers are making progress with their adventure scenarios and have not got into too deep water by making their plots too complicated to start with! If in real doubt, then you know our address. You never know, we may be able to help you 'puzzle it out'. ACU

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FROGGIE!

By C.Chin



This is a version of the popular arcade game with a similar name. You can tell that the original was not devised in the UK since it would have been know as "The hedgehog and the M1". You play the part of a stranded frog, or to be more accurate several stranded frogs. Home is a long way away. To reach it you have to negotiate a road and a fast-flowing river. Time is fleeting so hop to it!

```
10 REM *** AMSFROG *** by C.Chin 20/2/85
20 DEFINT a-z
30 GOSUB 2220
40 a=FRE("")
50 GOSUB 2100
60 WHILE -1
70 GOSUB 1970
80 kk$="iphks"
90 GOSUB 1910
100 IF k$="i" THEN GOSUB 2100
110 IF k$="p" THEN GOSUB 170
120 IF k$="h" THEN GOSUB 1680
130 IF k$="k" THEN GOSUB 1780
140 IF k$="s" THEN GOSUB 2080:GOTO 80
150 WEND
160 END
170 GOSUB 770
180 GOSUB 980
190 WHILE m>0
200 GOSUB 1250
210 GOSUB 1360
220 WHILE ok:k$=INKEY$
230 x1=x+dx*((k$=le$)-(k$=ri$))
240 y1=y+dy*((k$=do$)-(k$=up$))
250 IF y1<>y OR x1<>x THEN DI:GOSUB 610
260 IF y=358 THEN GOSUB 1520
270 WEND
280 SOUND 130,1,1,0
290 IF s=0 THEN GOTO 330
300 IF missed THEN SOUND 129,1000,60,15,0,2
310 IF hit THEN SOUND 129,400,0,15,2,0,15
320 IF splash AND y1<358 THEN SOUND 129,300
    ,0,7,3,0,15
330 IF missed OR splash OR hit THEN rt=-1
335 MOVE x,y:PRINT f$;:splash=0:missed=0
340 FOR i=1 TO 3:t=REMAIN(i):NEXT
350 TAGOFF:PRINT CHR$(23)+CHR$(0);
360 IF rt THEN GOSUB 1210
370 IF hit THEN GOSUB 1390:hit=0
380 IF ti<=0 THEN GOSUB 980
390 FOR i =1 TO 2000:NEXT:WHILE INKEY$<>"":
    WEND:WEND
400 GOSUB 830
410 RETURN
420 MOVE tx,0:DRAW tx,15:tx=tx-8
430 ti=ti-1:IF ti>16 THEN RETURN
440 SOUND 130,3000,800,2+((16-ti)\4)
450 IF ti=0 THEN ok=0
460 RETURN
470 |RSCR1,5,6,11,12,9,10,9,10:|LSCR1,7,8:|
    RSCR2,15,16,17,18,17,18:|LSCR2,21,22,19
    ,20,19,20
480 tur=tur+1:IF tur=26 THEN GOSUB 550
490 IF y=198 THEN RETURN
500 IF y>198 THEN 520
510 GOSUB 750:RETURN
520 x=x+16*(y=294)-16*((y=230)OR (y=326))-3
    2*(y=262):x1=x:y1=y
530 IF x>608 OR x<0 THEN GOSUB 720:ok=0:mis
    sed=-1
540 RETURN
550 tur=0:IF tu=1 THEN 600
560 PRINT#7,diturt$;:tu=1:tur=12
570 IF y<>294 THEN RETURN
580 IF x<192 THEN MOVE x-16,y:PRINT f$;:ok=
    0
590 RETURN
600 tu=0:tur=0:PRINT#2,turt$;:RETURN
610 IF y1<38 THEN EI:RETURN
620 IF s THEN SOUND 129,1000,0,10,1,1
630 MOVE x,y:PRINT f$;:IF y1>198 THEN GOSUB
     700 ELSE GOSUB 750
640 MOVE x1,y1:PRINT f$;
650 sc=sc-2*(y1>y)-(x1<>x):x=x1:y=y1
660 IF x1<0 OR x1>608 THEN ok=0:missed=-1:R
    ETURN
670 sc$=RIGHT$("0000"+MID$(STR$(sc),2),5):P
    RINT#1,sc$;
680 IF ok THEN EI
690 RETURN
700 IF TEST(x1+12,y1+2)=2 AND TEST(x1+16,y1
    +2)=2 THEN ok=0:splash=-1
710 RETURN
720 IF x1>608 THEN a=-16-16*(y1=262):MOVE a
    ,y1:PRINT f$;
730 IF x1<0 THEN MOVE 624,y1:PRINT f$;
740 RETURN
750 IF TEST(x1,y1-8)>1 OR TEST(x1+28,y1-8)>
    1 THEN ok=0:hit=-1
760 RETURN
770 WINDOW 1,20,1,25:WINDOW#1,7,11,1,1:WIND
    OW#2,17,19,7,8:WINDOW#3,3,3,3,4:WINDOW#
    4,8,8,3,4:WINDOW#5,13,13,3,4:WINDOW#6,1
    8,18,3,4:WINDOW#7,4,6,7,8
780 PEN#1,14:PAPER#2,2:PAPER#7,2
790 m=3:sc=0:ns=0:de=38:ti=48:tx=539:sc$="0
    0000"
800 a$=CHR$(22)+CHR$(1):PRINT#3,a$:PRINT#4,
    a$:PRINT#5,a$:PRINT#6,a$
810 SPEED KEY 20,18
820 RETURN
830 IF sc<h(8) THEN RETURN
840 h(8)=sc:i=8:h$(8)=""
850 WHILE h(i)>h(i-1)AND i>1
860 st=h(i):h(i)=h(i-1):h(i-1)=st
870 st$=h$(i):h$(i)=h$(i-1):h$(i-1)=st$
880 i=i-1:WEND
890 INK 14,26,0:INK 5,6,0
900 MODE 0:PRINT:PRINT:text$="  CONGRATULAT
    IONS":GOSUB 1300
910 PEN 15:PRINT:PRINT:PRINT:PRINT:PRINT:PR
    INT"  Your score is in        the top 8
    "
920 PEN 1:PRINT:PRINT:PRINT"  Enter your na
    me"
930 PRINT:PRINT:INPUT"      ",n$:IF LEN(n$)
    >8 THEN CLS:PRINT:PRINT:PRINT:PRINT:PRI
    NT:text$="  T O O   L O N G":GOSUB 1300
    :FOR n=1 TO 4000:NEXT:GOTO 900
940 h$(i)=n$
950 INK 14,26:INK 5,6
960 GOSUB 1680
970 RETURN
980 PAPER 0:CLS:FOR i=1 TO 4:ho(i)=0:NEXT
990 WINDOW 1,20,2,4:PAPER 3:CLS
1000 WINDOW 1,20,5,12:PAPER 2:CLS
```

```
1010 WINDOW 1,20,13,14:PAPER 1:CLS
1020 WINDOW 1,20,15,22:PAPER 0:CLS
1030 WINDOW 1,20,23,24:PAPER 1:CLS
1040 WINDOW 1,20,1,25
1050 tur=22:h=0:tu=0:ti=48
1060 PAPER 13:PEN 14:LOCATE 1,1:PRINT"SCORE
     :00000 HI:";:hi$=RIGHT$("0000"+MID$(ST
     R$(h(1)),2),5):PRINT hi$;:LOCATE 1,25:
     PRINT"TIME:";
1070 PRINT#1,sc$;:GOSUB 1180:GOSUB 1210
1080 FOR i=3 TO 6:PAPER#i,0:CLS#i:NEXT
1090 PAPER 2:a$=" "+slog$+u$+"       "+llog
     $:LOCATE 1,5:PRINT a$
1100 a$="      "+turt$+u$+"       "+turt$:LO
     CATE 1,7:PRINT a$
1110 a$=llog$+u$+"    "+slog$+u$+"    "+slog$
     :LOCATE 1,9:PRINT a$
1120 a$=slog$+u$+"     "+slog$+u$+"     "+slo
     g$:LOCATE 1,11:PRINT a$
1130 GOSUB 1390
1140 a=FRE("")
1150 RETURN
1160 DATA 4,16,112,244,300,388,400,528,76,1
     68,180,300,356,460,584,596
1170 DATA 12,46,140,172,332,364,460,492,8,4
     2,136,168,328,360,456,488
1180 FOR i= -192 TO 639 STEP 12:MOVE i,338:
     DRAW i+192,382,5:NEXT
1190 FOR i=60 TO 540 STEP 160:MOVE i,336:DR
     AWR 0,32,0:DRAWR 36,0:DRAWR 0,-32:NEXT
1200 RETURN
1210 ti=48:tx=539:FOR i=160 TO 543 STEP 8:M
     OVE i,0:DRAW i,15,2:NEXT:rt=0
1220 RETURN
1230 DRAWR 8,0,14:MOVER 0,2:DRAWR -8,0:RETU
     RN
1240 DRAWR 4,0,14:RETURN
1250 x=320:x1=x:ok=-1:TAGOFF:PRINT CHR$(23)
     +CHR$(0);
1260 y=38:y1=y:PEN 8:m=m-1:LOCATE 18,25:i=m
     :PRINT"   ";:LOCATE 18,25:WHILE i>0:i=
     i-1:PRINT f$;:WEND
1270 LOCATE 1,1:PRINT CHR$(23)+CHR$(1);:TAG
1280 PLOT 700,0,8:MOVE x,y:PRINT f$;
1290 RETURN
1300 xx=POS(#0):yy=VPOS(#0):xx=(xx-1)*32+4:
     yy=(26-yy)*16-3
1310 PLOT 700,700,5:PEN 14
1320 MOVE xx,yy:TAG:PRINT text$;:TAGOFF
1330 PRINT CHR$(22)+CHR$(1);:PRINT text$;
1340 PRINT CHR$(22)+CHR$(0)
1350 RETURN
1360 EVERY de*3.5,3 GOSUB 420
1370 EVERY de,1 GOSUB 470
1380 EI:RETURN
1390 WINDOW 1,20,15,22:PAPER 0:CLS:WINDOW 1
     ,20,1,25
1400 LOCATE 1,15:PRINT tr$(1)
1410 LOCATE 1,17:PRINT tr$(2)
1420 LOCATE 1,21:PRINT tr$(4)
1430 LOCATE 1,19:PRINT tr$(3)
1440 RESTORE 1160
1450 FOR i=170 TO 74 STEP -96
1460 FOR n=1 TO 8:READ a:MOVE a,i:GOSUB 124
     0:MOVE a,i-24:GOSUB 1240:NEXT
1470 NEXT
1480 FOR i=82 TO 114 STEP 32
1490 FOR n=1 TO 8:READ a:MOVE a,i:GOSUB 123
     0:MOVE a,i+22:GOSUB 1230:NEXT
1500 NEXT:hit=0
1510 RETURN
1520 IF ok=0 THEN RETURN
1530 FOR i=1 TO 3:t=REMAIN(i):NEXT
1540 x=x+96:IF (x\160)<>(x/160) THEN ok=0:x
     =x-96:missed=-1:RETURN
1550 x=x\160:IF ho(x)=1 THEN ok=0:missed=-1
     :x=x*160-96:RETURN
1560 ho(x)=1:hn=x+2:PRINT#hn,fh$;:h=h+1
1570 IF s THEN SOUND 129,0,1,0:FOR i=4 TO 1
     0:FOR n=0 TO 1:SOUND 1,i*40-n*20,3,7:N
     EXT:NEXT
1580 sc=sc+20:sc$=RIGHT$("0000"+MID$(STR$(s
     c),2),5):PRINT#1,sc$;
1590 m=m+1:GOSUB 1250
1600 GOSUB 1360
1610 IF h=4 THEN GOSUB 1630
1620 RETURN
1630 ns=ns+1:sc=sc+50*ns+5*ti
1640 sc$=RIGHT$("0000"+MID$(STR$(sc),2),5):
     PRINT#1,sc$;
1650 m=m+1:ok=0:ti=-1:h=0:de=de-4:IF de<22
     THEN de=22
1660 IF ns=4 THEN m=m+1
1670 RETURN
1680 PAPER 0:MODE 0
1690 text$="    HALL of FAME":GOSUB 1300
1700 text$="   "+STRING$(14,CHR$(154)):GOSU
     B 1300
1710 PRINT:PRINT:PRINT
1720 FOR i=1 TO 8
1730 PEN 8:i$=MID$(STR$(i),2):PRINT i$;":";
     :PEN 14:PRINT USING"####";h(i);:PEN 15
     :PRINT" ... ";:PEN 1:PRINT h$(i);
1740 PRINT:PRINT:NEXT
1750 PRINT:PRINT:PEN 3:PRINT"  Press SPACE
     BAR"
1760 kk$=" ":GOSUB 1910
1770 RETURN
1780 PAPER 0:MODE 0
1790 text$="   REDEFINE  KEYS":GOSUB 1300
1800 text$="  "+STRING$(16,CHR$(154)):GOSUB
      1300
1810 PRINT:PRINT:PEN 1:PRINT:PRINT"      LE
     FT :- ";:GOSUB 1880:le$=a$
1820 PRINT:PRINT:PRINT:PRINT"     RIGHT :-
     ";:GOSUB 1880:ri$=a$
1830 PRINT:PRINT:PRINT:PRINT"        UP :-
     ";:GOSUB 1880:up$=a$
1840 PRINT:PRINT:PRINT:PRINT"      DOWN :-
     ";:GOSUB 1880:do$=a$
1850 PRINT:PRINT:PRINT:PEN 3:PRINT"   Press
      SPACE BAR"
1860 kk$=" ":GOSUB 1910
1870 RETURN
1880 kk$="zxcvbnm,./\];:lkjhgfdsaqwertyuiop
     @[":REM ** last four characters a
     re CTRL [HIJK]
1890 GOSUB 1910:PEN 15:a$=k$:PRINT CHR$(1)+
     a$:PEN 1
1900 RETURN
1910 WHILE INKEY$<>"":WEND
1920 a=-1:WHILE a
1930 k$=INKEY$:IF k$="" THEN k$="!"
1940 IF INSTR(kk$,k$)<>0 THEN a=0
1950 WEND
1960 RETURN
1970 MODE 0
1980 s=s XOR 1:GOSUB 2080:LOCATE 1,1
1990 text$="  AMSTRAD  FROGGER":GOSUB 1300

2000 text$=" "+STRING$(18,CHR$(154)):GOSUB
      1300
2010 PRINT:PEN 14:PRINT" Press :"
2020 PEN 15:PRINT:PRINT:PRINT"P";:PEN 1:PRI
     NT" :to  PLAY GAME"
2030 PEN 15:PRINT:PRINT:PRINT:PRINT"I";:PEN
      1:PRINT" :for INSTRUCTIONS"
2040 PEN 15:PRINT:PRINT:PRINT:PRINT"H";:PEN
      1:PRINT" :for HALL of FAME"
2050 PEN 15:PRINT:PRINT:PRINT:PRINT"K";:PEN
      1:PRINT" :to  REDEFINE KEYS"
2060 PEN 15:PRINT:PRINT:PRINT"S";:PEN 1:PRI
     NT" :for SOUND ON/OFF"
2070 RETURN
2080 s=s XOR 1:LOCATE 20,1:PEN 10:IF s THEN
      PRINT s$; ELSE PRINT" ";
2090 RETURN
2100 PAPER 0:MODE 0
2110 text$="    INSTRUCTIONS":GOSUB 1300
2120 text$="   "+STRING$(14,CHR$(154)):GOSU
     B 1300
2130 PRINT:PEN 1:PRINT"Help the tired frog
     to his resting placeat the top of the
      screen."
2140 PEN 2:PRINT:PRINT"Avoid the traffic on
     the road, and hop  across the river o
     n the logs and turtles";
2150 PEN 5:PRINT:PRINT"Controls :"
2160 PEN 15:PRINT:PRINT"'";CHR$(1);le$;"' .
     ... to go left"
2170 PRINT:PRINT"'";CHR$(1);ri$;"' .... to
     go right";
2180 PRINT:PRINT"'";CHR$(1);up$;"' .... to
     go up"
2190 PRINT:PRINT"'";CHR$(1);do$;"' .... to
     go down"
2200 PRINT:PEN 3:PRINT"  Press SPACE BAR";

2210 kk$=" ":GOSUB 1910:RETURN
2220 CALL &BC02:DIM h$(8),h(8),ho(4)
2230 SPEED INK 40,20
2240 FOR i=1 TO 8:h$(i)="Amstrad ":h(i)=300
     :NEXT
2250 dx=32:dy=32:le$="z":ri$="x":up$=":":do
     $=".":s$=CHR$(210):s=1
2260 BORDER 0:PAPER 0:ZONE 255
2270 KEY DEF 0,1,11:KEY DEF 1,1,9:KEY DEF 2
     ,1,10:KEY DEF 8,1,8
2280 GOSUB 2390
2290 GOSUB 2330
2300 GOSUB 3170
2310 GOSUB 2410
2320 RETURN
2330 ENV 1,5,1,2,2,-1,1,10,-1,1,5,1,1,5,-1,
     3
2340 ENT -1,5,-50,2,5,50,1
2350 ENV 2,1,0,20,14,-1,2
2360 ENV 3,8,1,2,14,-1,4
2370 ENT 2,1,0,20,3,127,1,1,0,40
2380 RETURN
2390 RESTORE 2400:FOR i=0 TO 15:READ d:INK
     i,d:NEXT:RETURN
2400 DATA 0,24,2,3,1,6,21,5,9,9,18,18,18,0,
     26,4
2410 SYMBOL 200,0,0,0,63,96,78,192,223
2420 SYMBOL 201,0,0,0,255,0,60,0,126
2430 SYMBOL 202,0,0,0,252,6,114,3,251
2440 SYMBOL 203,192,223,192,78,96,63,0,0
2450 SYMBOL 204,0,126,0,60,0,255,0,0
2460 SYMBOL 205,3,251,3,114,6,252,0,0
2470 SYMBOL 206,0,0,0,8,31,126,248
2480 SYMBOL 208,0,0,0,0,8,252,62,63
2490 SYMBOL 209,248,248,126,31,8,0,0,0
2500 SYMBOL 210,12,12,12,12,12,60,124,56
2510 SYMBOL 211,63,63,62,252,8,0,0,0
2520 SYMBOL 212,0,0,0,0,16,63,124,252
2530 SYMBOL 214,0,0,0,0,16,248,126,31
2540 SYMBOL 215,252,252,124,63,16,0,0,0
2550 SYMBOL 217,31,31,126,248,16,0,0,0
2560 SYMBOL 218,0,0,0,126,206,206,206,207
2570 SYMBOL 219,0,0,0,255,255,255,255,255
2580 SYMBOL 220,207,207,206,206,206,126,0,0
2590 SYMBOL 221,255,255,255,255,255,255,0,0
2600 SYMBOL 222,0,0,0,126,115,115,115,243
2610 SYMBOL 223,243,243,115,115,115,126,0,0
2620 SYMBOL 224,0,0,0,15,127,241,193,193
2630 SYMBOL 225,0,0,0,255,131,254,254,254
2640 SYMBOL 226,0,0,0,254,63,63,63,63
2650 SYMBOL 227,193,193,193,241,127,15,0,0
2660 SYMBOL 228,254,254,254,254,131,255,0,0
2670 SYMBOL 229,63,63,63,63,63,254,0,0
2680 SYMBOL 230,0,0,0,127,252,252,252,252
2690 SYMBOL 231,0,0,0,255,193,127,127,127
2700 SYMBOL 232,0,0,0,240,254,143,131,131
```

```
2710 SYMBOL 233,252,252,252,252,252,127,0,0
2720 SYMBOL 234,127,127,127,127,193,255,0,0
2730 SYMBOL 235,131,131,131,143,254,240,0,0
2740 SYMBOL 236,0,0,0,119,17,63,63,127
2750 SYMBOL 237,255,127,63,63,17,119,0,0
2760 SYMBOL 238,0,0,0,0,24,36,66,153
2770 SYMBOL 239,165,153,66,36,24,0,0,0
2780 SYMBOL 240,102,36,60,60,24,126,90,195
2790 SYMBOL 241,0,0,126,255,126,60,126,126
2800 SYMBOL 242,255,255,255,126,126,126,0,0
2810 SYMBOL 243,36,36,0,60,0,0,0,36
2820 SYMBOL 244,24,153,153,90,90,90,219,0
2830 RESTORE 3040
2840 r=12:GOSUB 3160:slog$=a$
2850 r=18:GOSUB 3160:llog$=a$
2860 r=9:GOSUB 3160:lcar$=a$
2870 r=9:GOSUB 3160:rcar$=a$
2880 r=15:GOSUB 3160:llorry$=a$
2890 r=15:GOSUB 3160:rlorry$=a$
2900 r=12:GOSUB 3160:rsal$=a$
2910 r=12:GOSUB 3160:lsal$=a$
2920 r=12:GOSUB 3160:turt$=a$
2930 r=12:GOSUB 3160:diturt$=a$
2940 r=15:GOSUB 3160:fh$=a$:f$=CHR$(240)
2950 b1$=CHR$(14)+CHR$(13):b2$=CHR$(14)+CHR
     $(0)
2960 lcar$=b1$+lcar$+b2$:rcar$=b1$+rcar$+b2
     $:llorry$=b1$+llorry$+b2$:rlorry$=b1$+
     rlorry$+b2$
2970 rsal$=b1$+rsal$+b2$:lsal$=b1$+lsal$+b2
     $
2980 u$=CHR$(11):loe$=CHR$(15)+CHR$(7)+CHR$
     (219)+CHR$(8)+CHR$(10)+CHR$(221)+u$:lo
     e$=b1$+loe$+b2$
2990 tr$(1)=loe$+rlorry$+"    "+rsal$+u$+"
     "+loe$+loe$+rlorry$
3000 tr$(2)=rcar$+u$+"  "+rcar$+u$+"    "+r
     car$+u$+"  "+rcar$
3010 tr$(4)="  "+llorry$+loe$+"    "+lsal$+u
     $+"  "+llorry$+loe$+loe$
3020 tr$(3)=lcar$+u$+"  "+lcar$+u$+"    "+l
     car$+"  "+u$+lcar$
3030 RETURN
3040 DATA 15,3,200,201,202,10,8,8,8,203,204
     ,205
3050 DATA 15,3,200,201,201,201,202,10,8,8,8
     ,8,8,203,204,204,204,205
3060 DATA 15,6,206,208,10,8,8,209,211
3070 DATA 15,4,212,214,10,8,8,215,217
3080 DATA 15,5,218,10,8,220,15,7,221,221,11
     ,8,8,219,219
3090 DATA 15,7,219,219,8,8,10,221,221,15,5,
     223,8,11,222
3100 DATA 15,15,224,225,226,8,8,8,10,227,22
     8,229
3110 DATA 15,3,230,231,232,8,8,8,10,233,234
     ,235
3120 DATA 15,4,236,236,236,8,8,8,10,237,237
     ,237
3130 DATA 15,4,238,238,238,8,8,8,10,239,239
     ,239
3140 DATA 15,10,241,8,10,242,31,1,1,15,3,24
     3,8,10,244
3150 DATA 15,3,243,8,10,244
3160 a$="":FOR i=1 TO r:READ d:a$=a$+CHR$(d
     ):NEXT:RETURN
3170 RESTORE 3260:SYMBOL AFTER 200:MEMORY &
     A2FF
3180 SOUND 129,1000,80,10,1,1:SOUND 1,1000,
     0,10,1,1:SOUND 1,1000,0,10,1,1
3190 MODE 0:INK 0,0:PEN 1:PRINT:PRINT:PRINT
     :PRINT:PRINT:PRINT:PRINT:PRINT:PRINT
3200 text$="      AMSFROG":GOSUB 1300
3210 FOR i=&A300 TO &A414
3220 READ d$:d=VAL("&"+d$)
3230 POKE i,d:NEXT
3240 CALL &A300
3250 RETURN
3260 DATA 01,0E,A3,21,0A,A3,CD,D1,BC,C9,00,
     00,00,00,1C,A3
3270 DATA C3,45,A3,C3,6D,A3,C3,95,A3,C3,D5,
     A3,4C,53,43,52
3280 DATA B1,52,53,43,52,B1,4C,53,43,52,B2,
     52,53,43,52,B2
3290 DATA 00,DD,6E,00,DD,23,DD,23,2D,26,00,
     29,29,29,29,E5
3300 DATA D1,29,29,19,C9,F5,CD,31,A3,11,00,
     C0,19,23,06,08,C5
3310 DATA E5,D1,23,01,4E,00,1A,F5,1B,1A,ED,
     B0,12,F1,13,12,01,B1,07,09,C1,10
3320 DATA E8,F1,3D,20,D9,C9,F5,CD,31,A3,11,
     4F,C0,19,2B,06,08
3330 DATA C5,E5,D1,2B,01,4E,00,1A,F5,13,1A,
     ED,B8,12,F1,1B,12,01,4F,08,09,C1
3340 DATA 10,E8,F1,3D,20,D9,C9,F5,CD,31,A3,
     11,02,C0,19,06
3350 DATA 08,C5,E5,D1,06,02,1B,1A,F5,FE,04,
     38,02,AF,12,10,F5,06,4E,7E,FE,04,38,04
     ,12,3E
3360 DATA 00,77,23,13,10,F3,06,02,F1,FE,04,
     38,01,12,13,10,F7,01,B2,07,09
3370 DATA C1,10,CF,F1,3D,20,C1,C9,F5,CD,31,
     A3,11,4D,C0,19
3380 DATA 06,08,C5,E5,D1,06,02,13,1A,F5,FE,
     04,38,02,AF,12,10,F5,06,4E,7E,FE,04,38
     ,04,12
3390 DATA 3E,00,77,2B,1B,10,F3,06,02,F1,FE,
     04,38,01,12,1B,10,F7,01,4E,08
3400 DATA 09,C1,10,CF,F1,3D,20,C1,C9
```

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Software reviews

CATASTROPHE



This is one of the simplest and addictive games I have seen on the Amstrad so far, and, once hooked it is difficult to resist playing just one more game in the hope of reaching the ultimate target.

Well, what's it all about? You have a company helicopter at your disposal. With this helicopter you must pick up prefabricated building blocks from the supply ship and place them carefully one by one onto the building site. Having mastered placing the blocks in just the right position so that they don't fall off into the sea, the task in hand appears easy enough. The weather, however, is not under your control and you only have a day in which to reach your target score. But don't be misled by what is happening to the building site to the left of the screen since the computer positions its blocks in a random manner. Choose your own strategy and stick to it!

For each block placed, 100 points is awarded to your score and for each storey constructed, a bonus of 600 points is given. Therefore it is worth concentrating on an individual storey to obtain the maximum number of points possible during the time allowed for each days work. As far as other points of strategy are concerned, I will leave it for you to find out for yourselves....

Every now and then an overhead flying aircraft appears from the edge of the screen. Beware of a collision with this aircraft as it will result in the loss of one of your four helicopters. If the lighthouse starts to flash watch out for a change in the weather: earthquakes and hurricanes are not too drastic but an electric storm could hinder and perhaps ruin a whole days work if not enough thought has been given to the overall construction of the site. In other words, aim to build a construction that will withstand the most arctic of conditions. Once you have reached the target for the first day, a new target is given and you go on to the second day and carry on thus until the game is finished.

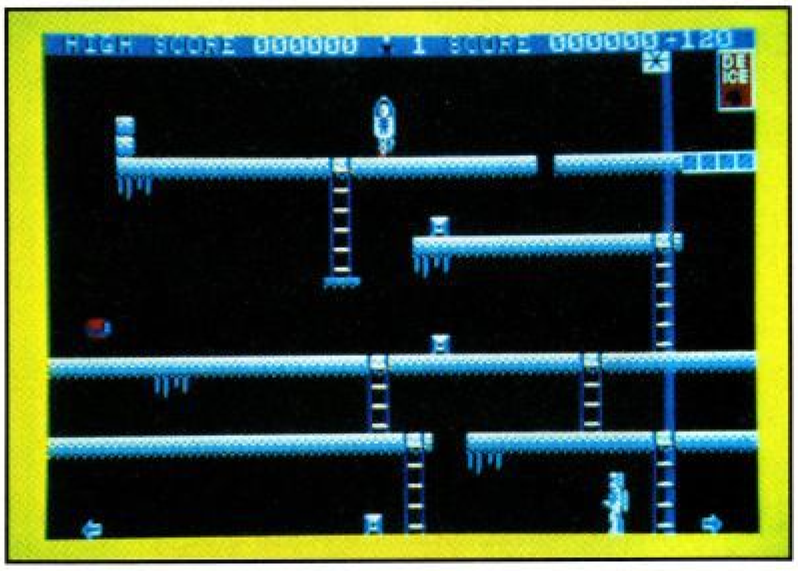
On start up, there are two levels of play to choose from --amateur or professional. The only real difference between them is that everything happens very much faster on the professional level, and that the daily score targets are slightly higher. Although it isn't stated on the instruction page, it is possible to play the game with two players using a JY-2 and another joystick plugged into the back. Don't forget to choose to do so before the game commences, otherwise the computer will begin to play as if it is in one player mode.

The screen graphics complement the simplicity of the game and it is quite fun just to watch in demonstration mode. Look out for the rising of the sun at the start of the day and setting at the end.

Overall, well worth a look at, although as it is such an addictive game its a shame that there is only the one screen to play...

AUTHOR:	AMSOFT/ANDROMEDA SOFTWARE LTD
FORMAT:	Cassette
PRICE:	£8-95
GRAPHICS:	***
PLAYABILITY:	****
ADDICTIVENESS:	****
OVERALL:	****

MR. FREEZE



This is a typical ladders and platforms type of game where the objective is to work your way from the bottom of the screen to the top by avoiding the many nasties and pitfalls on the way. The scene is set in the inside of a fridge which has 6 compartments (6 screens) in all. Each has to be de-iced. The special de-ice button is located, of course, at the top of the screen and having made it that far, you must fight your way back down the platforms to be able to proceed to the next compartment.

It all sounds very easy, and it would be if it weren't for the laser guarded stairs. They are very tricky to negotiate at first but once mastered the task does become much easier. The only weapon that you possess against the other horrors that await, such as flying food, guardian robots and ice cubes is a flame thrower. This, incidentally, isn't any use at all to fight the lasers.

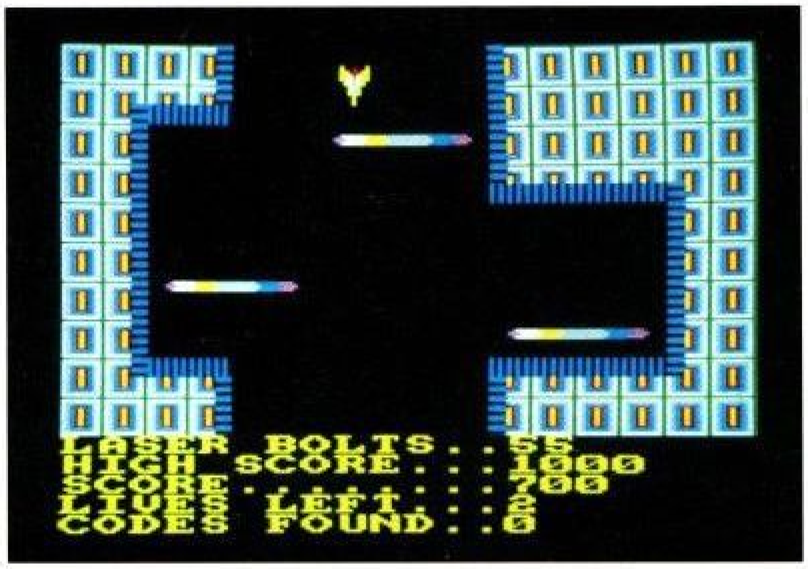
Fortunately, the compartments need not be de-iced in any special order. It is therefore possible to tackle the easier

screens first for practice before trying your luck at the harder ones. Our hero Mr. Freeze has 6 lives and as each is lost he is turned into ice before being reincarnated to continue the quest.

I thought it was rather a shame that there are only 6 screens to negotiate (although some are very difficult) since once the timing of the jumps has been perfected and the lasers mastered, the initial impact of the game is lost. I found the graphics rather uninspiring. Although, to be fair they were very distinctive on the green screen monitor. For those without joysticks there is a sensible keyboard option.

AUTHOR:	FIREBIRD
FORMAT:	Cassette
PRICE:	£2.50
GRAPHICS:	**
PLAYABILITY:	***
ADDICTIVENESS:	**
OVERALL:	**

THE PRIZE



This is a shoot-them-up game based within the confines of a maze. The ultimate objective is to find 'The Prize' by solving the mystery of the maze with the help of your spaceship Almazoon. It is nicely presented with colourful and smooth graphics and all the necessary noises which go hand-in-hand with this type of game.

The overall task is simple enough. You must, however,be prepared to persevere as the maze can become surprisingly confusing and finding your way to a particular spot whilst dodging a multitude of nasties can be difficult. Apart from avoiding untimely death, your main task is to explore and collect, in numerical order, the code pods which are scattered around the inner walls of the maze. After having collected all the pods, you must find your way to code pod B which will transport you to the next level where there are more code pods to collect until eventually you find yourself on level 4 where the treasure is to be found.

As you negotiate and pass through each maze portion, the screen changes to a continuing section in which you'll find another selection of nasties. The obstacles appear in four different forms: mutants, crushers, death drones and messengers. As their names suggest they can all be lethal. Both the crushers and death drones require lightening reflexes and it can take some time to decide on the best course of action when confronted with these. With time and practice, however, success can be achieved, but often with the result of continuing to another screen in too much haste and colliding with some other unexpected nasty.

Fortunately some of the guardians can be destroyed on contact, thus preserving some of your precious laser bolts for more desperate use. At the beginning of play, you have 75 laser bolts on board which, surprisingly, are soon reduced to none. Supplies can easily be replenished, however, at the Power Plant located on each level.

Energy bases give you the required boost to become immune to the effects of the guardians. These are the most useful means by which you can explore and collect the code pods at leisure! Unfortunately, the immunity factor is only given for a undetermined amount of time and it never seems to be long enough....

If you enjoy a game which involves tearing around the screen and shooting at everything in sight, but with a certain amount of strategy and thought involved then this is probably for you.

I didn't quite make it to level 4 so I cannot hint as to what prize awaits you there, but I trust that it befits the determination it would take to reach the end of the game.

AUTHOR:	AMSOFT/ARCADE SOFTWARE LTD
FORMAT:	Cassette
PRICE:	£8-95
GRAPHICS:	***
PLAYABILITY:	***
ADDICTIVENESS:	***
OVERALL:	***

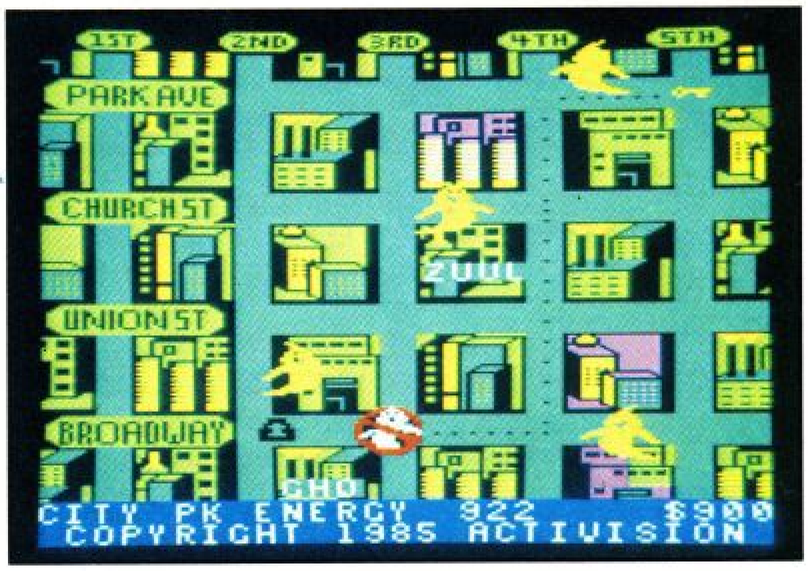
GHOSTBUSTERS



After almost everyone saw the film "Ghostbusters", the computer game was lined-up to be a hit. First of all there was the Commodore version (people tell me this is the best for graphics, sound and playability) which zoomed up towards number one in the top ten. Then came the Spectrum version that was obviously not as good as far as graphics and sound were concerned, but still, two versions were in the top ten. Now it's Arnold's turn. You've got three ghostbusters and a ghost-inhabited city. Once loaded, you'll you find yourself tapping your foot along to J Parker Junior's catchy tune. You are then asked to buy a car. Prices range from $200 for a VW Beetle look-alike right up to a $15000 sports car. Then, equip your vehicle with various ghostbusting weapons; ghost traps, marshmallow man detectors, PK energy

detectors and a pair of goggles that let you see ghosts.

After loading-up, you set-off around the city. You have to move your famous "Ghostbusters" sign around blocks in the city. This maps your route to your destination. If you should pass a ghost you will have the opportunity to 'bust' a ghost with your vacuum cleaner. On reaching your haunted house -- highlighted in flashing red -- you have to lay a trap and ensnare the ghost. This requires a great amount of skill, as you have to catch the ghost between the beams of your nutrona wands. If you should fail to do this, the ghost will 'slime' you. The quicker you react to an emergency call, the more money you obtain for catching the ghost in the trap. When all your traps are full, or if two men get 'slimed' you will need to return to HQ. If you have earned enough money from ghostbusting, you will be able to enter the dreaded Temple of Zuul. This is where you must go and close the Temple gates to stop Keymaster and Gatekeeper from meeting. Marshmallow man is there-so watch out!



Unfortunately, there is no real variation in the game. Initially, it is great fun and the musical is wonderful. Once the attraction starts to pale, however, I reckon it would gather dust more quickly than usual as its addictive qualities are lacking.

AUTHOR	Activision
FORMAT	Cassette
PRICE	£10.99
GRAPHICS	****
ADDICTIVENESS	**
PLAYABILITY	***
OVERALL	***

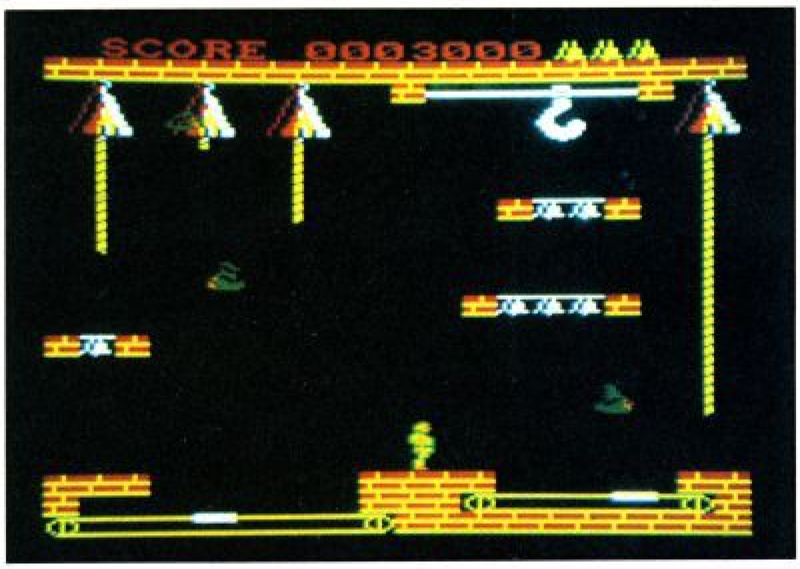
Hunchback II

No prizes for guessing that this one is the follow-up to Hunchback. Subtitled "Quasimodo's Revenge", this is one of a series of games released by Ocean all using a speed loader/protector (all of 15% faster than normal) and all of which fail to work on a 664.

The game starts with a garish loading screen which disappears three and a half minutes later, giving way to some music which sounds so jarring and wavery that it is almost funny. You select your options and the screen comes up with "Ready ?". Ready or not the game starts five seconds later but you do get hold and abort keys. The program does allow you to use either the joystick or to define your own idea of what makes a good keyboard control.

The plot consists of wandering through five screens collecting The Bells (Der Bells made me dith way Mathter) while avoiding the best efforts from the bat population and the Notre Dame and District Ladies Archery Association. Successive screens add fireballs, cannon balls plus what look like low flying clods of chilli con carne and are just as devastating.

You leap on to moving ropes, platforms and hooks to get from one platform to another. Strangely, you can manoeuvre yourself in mid air with the joystick thus defying Newtons Law of Commotion. This is necessary because you don't seem to stick to a moving rope, platform or whatever unless you are moving a little bit sideways. Persevere, it is possible.



The last screen has you shinnying up ropes to push clappers against some large bells. Ring all of these and you get to see (but not kiss) Esmarelda. She is only 3x2 character squares small but at least she is there.

The Quasimodo character is quite well depicted and animated as long as he doesn't try climbing a rope. Then he looks like one of those small green beetles that falls into your picnic when you sit under a tree.

Animation of the other pieces is not quite so good, the cannon balls especially seem to flicker like a dying striplight when they get near the bottom of the screen and the clappers on the last screen are none too steady.

There is a high score table, you move a cursor around and select your letters from a table on the screen. You can only go backwards or forwards and the rubout does not work properly thus giving rise to some very strange names and/or swearwords.

This game is recommended for all budding campanologists but did not have much lasting appeal to me. Some people might like this game and it is better than its predecessor.

AUTHOR	OCEAN
FORMAT	Cassette
PRICE	£8.95
GRAPHICS	***
PLAYABILITY	**
ADDICTIVENESS	**
OVERALL	**

Continued on page 66



3D LANDMARKS YOU CAN FLY AROUND

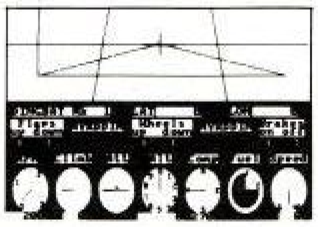
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AMSTRAD CPC 464

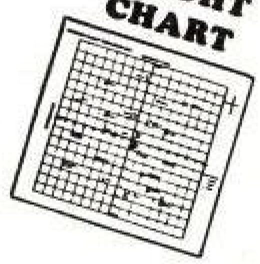


MANUAL

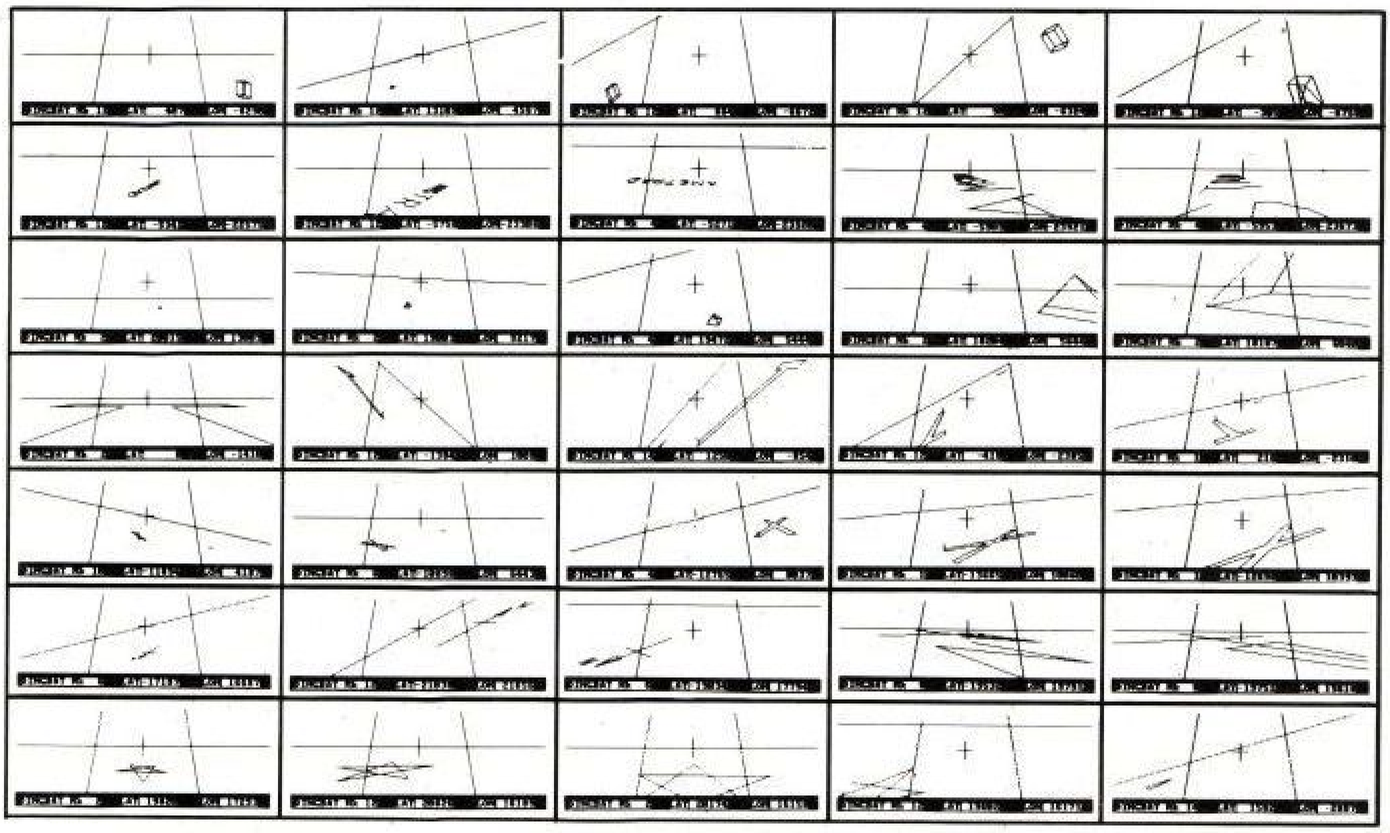


FULL SCREEN DISPLAY

FLIGHT CHART



Here are some screens from a typical flight showing the view from the cockpit (top half of screen) produced as printouts of the actual simulator.



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101 Naughty Things to do with The 6845

by Adam Denning

Warning! Amsoft disapproves of a lot of the tricks in this article. This is because they do not use the legal calls given in the firmware manual and so they will not work on all machines, worse the firmware may become confused and not behave as expected.

The impressive screen display capabilities of the CPC464 and 664 are due in no small part to a chip inside the machine called the 6845. This isn't a very impressive name, so it is often referred to as the 'CTRC', which stands for 'Cathode Ray Tube controller'. Its purpose is to look after the screen mode and make a displayable picture out of the data it finds in the screen RAM.

The screen RAM is an area of the CPC464's random access memory which is devoted to holding the screen image details. As you know, a screen is formed from various textual characters such as 'A', 'b' and so on, and graphics such as lines and circles.

The 6845 is capable of looking after all these things for us, giving the CPC464 what is known as a 'hard screen', as it is controlled by hardware rather than by software. A purely hardware controlled screen is able to manipulate screen data at very high speed, but unless the computer manufacturer has spent a fortune on choosing the most impressive chip available, it can't do as wide a variety of things as a 'soft' screen.

A soft screen is not as fast as a hard screen because the microprocessor in charge of overall operations has to take time out to look after the production of the screen display, while those computers using a chip to do this can speed things up by sending the chip a few simple commands and leaving it to get on with it.

Those nice guys at Locomotive and Amsoft have not been stupid. They've seen that they somehow had to come up with something almost as fast as a hard screen but at the same time as versatile as a soft screen. So they compromised, and used a mixture of both types to get the best of both worlds.

Of course, there are always applications where you wish that something was not quite what it is, but then the ingenuity of programmers wouldn't be called into action so frequently if everything was perfect.

Well, you pays your money and you takes your choice, and we've got ourselves a 6845 sitting in the middle of the machine ready to be programmed and produce some sizzling special effects. You'll be pleased to know that really expensive computers like the IBM PC use a 6845 to look after their screens, as well. One ever-so-slight problem with the 6845 is that it's not that easy to get to grips with programming it.

When the CPC464 is left to deal with the 6845, it's well behaved and produces displays in all three screen modes as expected. Part of the compromise involved with soft/hard screen choice is that the cursor (the little flashing square just ahead of what you're typing) is not controlled by the 6845, and neither is the selection of colours. The 6845 is certainly able to look after the cursor, but not on the 464.

The Amstrad's operating system programs the chip most of the time, setting the 'base of the screen', the number of characters which can be displayed in a given mode, and so on. We can alter all this, setting the base address of the screen to any of four places, and altering the number of characters (and their size) which may be displayed at one time.

To see how we can do this, let's take a quick look at the insides of the beast. We see that it has 18 'registers', which are similar to memory locations except that they're located inside the 6845 rather than inside a memory chip. These registers are used by us to tell the 6845 what to do, and by the 6845 to reassure us that it's doing everything just as we asked.

Fourteen of these registers are 'write only', which means that we can put data into them (we'll see how later) but we can't get anything from them. They are similar to memory locations which we can POKE but not PEEK (WOM - write-only memory). Two other registers are 'read only', which means we can read whatever the 6845 puts in them, but we can't put new values in there in the hope that the 6845 will do something with them. If we do try to write to these registers, the CPC464 hardware ensures that our efforts are ignored.

The final pair of 6845 registers bear much more relation to memory locations, as they can be written to and read from. They are known as 'read / write' registers.

Now, to select which of these eighteen registers we want to communicate with, we have to put a value into another of the 6845 registers called the 'address register'. This value which we put into the address registers is used internally by the 6845 to point to one of its registers.

The first register is 8 bits wide, which means that it is the same size as a memory location (1 byte) and can hold any number from 0 to 255. This register determines the 'horizontal sync frequency', which is related to the number of characters which may be displayed on a line. It is one of the 'write only' registers' and we'll refer to it as RO.

The second register is also 8 bits wide and write only, and holds the number of characters displayed on a line. It's R1.

The third (8-bit, write only) register is R2 and determines how far off the edge of the screen the display starts. The larger the number in here, the more leftwards the screen starting position.

Don't alter the next register (R3) unless you want an unreadable screen, as it determines the 'sync'. If the sync is wrong, the display goes haywire (it isn't dangerous to the machine, but it isn't a very useful effect).

The next register (R4) is 7 bits wide and write only, and together with the next register determines the 'vertical sync frequency'.

See above for the description of R5 (5 bits wide w/o).

R6 is 7 bits wide, write only, and determines the number of characters which fit down a page - in other words, the number of rows on the screen.

Most of the other registers are concerned with light pens and cursor positioning (which isn't used on the Arnold), except for R12 an R13 which together form the base address of the screen. The CPC464 hardware limits us a bit here, and only allows the screen base address to be at 0000, 40000, 80000 or C000 (all numbers in hexadecimal).

Now that we know a bit about the thing, let's have a play and see what we can do with it.

To be able to program a 'peripheral chip' (which is what the 6845 is) in a Z80 system, we have to know which 'port' it lives on. As the 6845 has quite a few registers, it also has quite a few port addresses. The important one to use is &HBCxx (the 'xx' is unimportant, and can be anything from 00 to FF), which is the port address of the address register.

We can't PEEK or POKE the Z80's ports, as they are not 'memory mapped'. We have to use the special Basic instructions INP and OUT instead.

First trick, then: type

```
OUT &HBC00,0:OUT &HBD00,126
```

Well, it might be useful for something!

Now for a bit of sideways scrolling, try this program:

```
10 FOR a=0 TO 50
20 OUT &HBC00,2
30 OUT &HBD00,a
40 FOR B=0 TO 100:NEXT B
50 NEXT a
```

By altering the value of the FOR..NEXT loop on line 40, you can get some really zappy scrolling effects. They could give you some great game ideas.

So what do we do to get vertical scrolling? This is a bit harder, as we would normally alter the screen base address very slightly to make everything barrel-roll by one character. As the hardware inside the CPC464 stops us from doing this, we can only implement a slight vertical scroll.

We do this most effectively be altering the value in register R5. By making this vary between about 10 and -10, we can make the screen jump up and down by small amounts. If we go too much outside these limits, the 6845 loses sync and the picture starts rolling endlessly.



Now for total madness, we could combine the two and get a diagonally moving screen. The program below does this, but it gets a bit out of control at time. Experimentation with a few values here and there should produce some useful routines for use in your own programs.

```
10 while 1
20 for a=0 to 50
30 out &HBC00,2
40 out &HBD00,a
50 out &HBC00,5
60 out &HBD00,a
70 for b=0 to 50:next b
80 next a
90 wend
```

As we said at the beginning, and as you have probably discovered by now, programming the 6845CRTC may not be the easiest thing in the world but it is the most fun!

By playing around with various other registers, randomly outputting values to each one (try a few in combination, too), you'll be surprised at what effects you can drag up. With a chip as powerful as this, most things are possible and it all adds enormously to the scope of the machine.

ACU

Convert your 664 into a 464

A retrograde step ? Cliff Lawson explains why this is not always the case.....

Those lucky people who now have a CPC664 will most probably have rushed out and bought several Amsoft games cassettes to try out the machine while waiting for the disc based software to appear in the shops. Unfortunately, you may well have discovered that several of these games (Codename MAT and Pyjamarama for instance) will not load, but stop with a 'MEMORY FULL' error.

The reason for this is not due to any incompatibility between 464 and 664 machines (the same thing happens on a 464 with a disc drive). It is caused by the disc ROM which claims 1284 bytes of memory for its own use. On a 464 with disc the solution is simple -just don't switch the disc on before switching on the computer. With a 664, the disc ROM will always be powered up when the machine is switched on - there is no simple hardware solution by which BASIC can reclaim the memory used by the disc firmware.

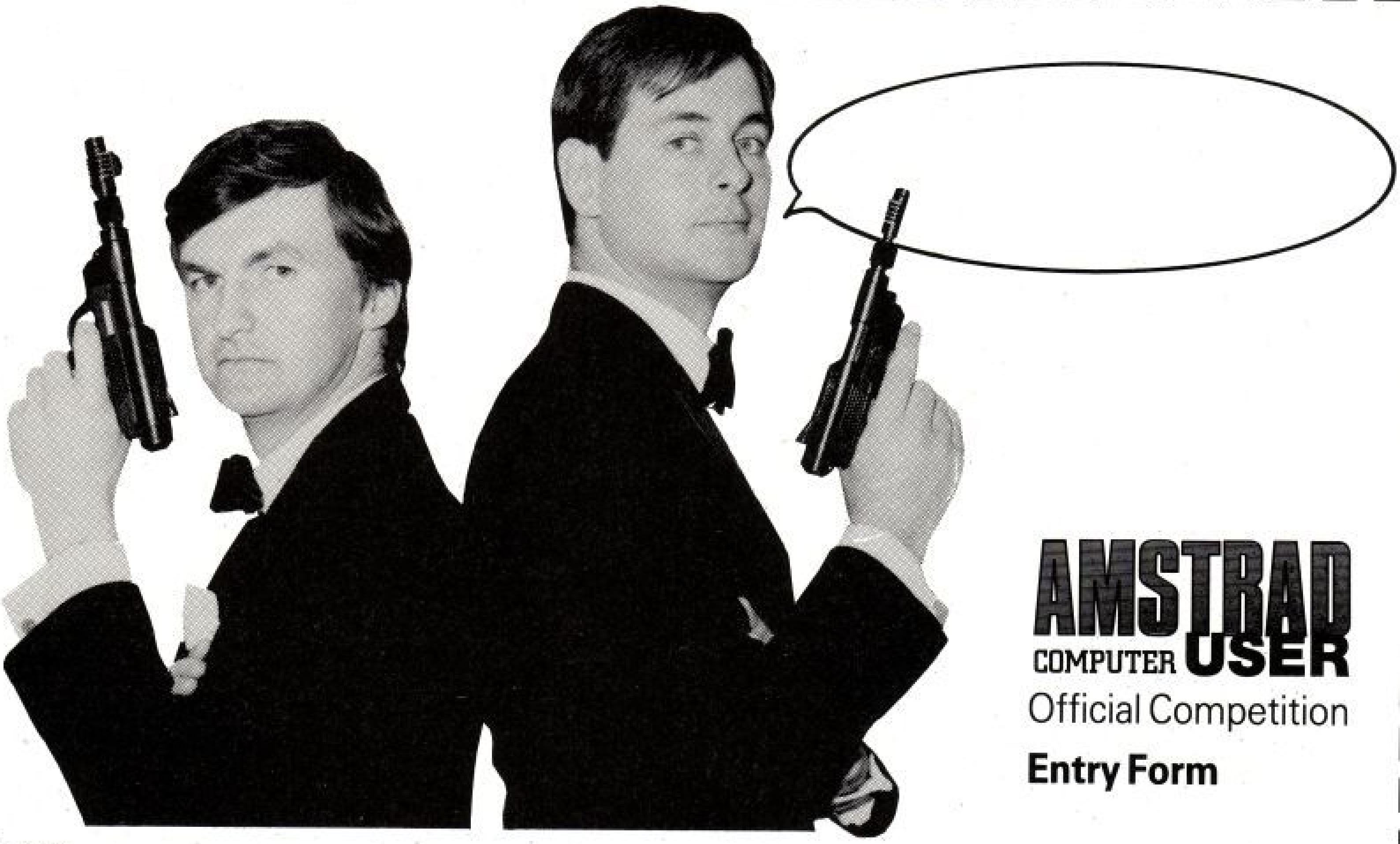
Help is at hand - if you type in the short program below and save it on a disc, then, whenever you wish to load one of the memory guzzling cassette programs, just pop the disc in and run the program. You should be met with the message 'BASIC 1.1' (or 1.0 if you use it on a disc based 464). PRINTing HIMEM should now return the value 43903, rather than 42619 when the disc was working. A side effect of this program is that none of the disc commands (|TAPE, |DIR,etc) will function at all - the machine acts just like a tape based 464.

```
190 MEMORY &7FFF
200 entry=&8000
210 sum=0
220 FOR addr=0 TO &3E
230  READ byte$
240  POKE entry+addr,VAL("&"+byte$)
250  sum=sum+VAL("&"+byte$)
260 NEXT addr
270 IF sum <> 6058 THEN PRINT "Data erro
    r":END
280 CALL entry
290 NEW
300 PRINT HEX$(sum)
310 DATA cd,c8,bc,7a,b3,20,05,06,00,11,0
    6,c0,ed,53,3c,80
320 DATA ed,43,3e,80,21,1c,80,0e,fc,cd,1
    6,bd,2a,3c,80
330 DATA ed,4b,3e,80,48,3e,c9,32,cb,bc,2
    2,39,80,79,32,3b,80
340 DATA 11,40,00,21,ff,ab,df,39,80,00,0
    0,00,00,00,00,00
```

These lines were missed from last month's Writing Adventures listing.

```
960 FOR i=1 to 2000:NEXT i
965 GOTO 1500
```

Win a Printer. Win a Printe Printer. Win a Printer. Win



AMSTRAD COMPUTER USER
Official Competition
Entry Form

Name ....
Address ....
....

These two people are the directors of the software house 'Domark'. They got togged up to promote their new game 'View to a Kill" named after the new James Bond movie. One thing you can afford to do if you are a rich director is go out and buy a printer. In response to the many people who are not company directors who have written in and asked, we are offering a free printer. Better than that we are offering three free printers. The people who really deserve the thanking are Datastar systems UK, they have given us three of thier brand new Gemini Star printers. The new model of the Gemini Star sounds really good. It offers near letter quality (NLQ) printing and is both fast and fairly quiet. Each printer is worth about £300 so if you don't enter you could really be missing out.

How to win.

Winning is simple. Put a caption to the photograph. The three entries which make us laugh the most will win.

Rules

1 The winners will be the funniest three entries which have arrived at the Amstrad Computer User office by July 30th.

2 There is no limit to the number of entries any individual can make, however each entry must be on an official entry form; photocopies are not acceptable.

3 Entries should be sent to: Amstrad Computer User, Datastar Printer Competition, 169 Kings Road, Brentwood, Essex,CM14 4EF.

4 No correspondence can be entered into regarding the competition. Entries cannot be returned.

5 The judges' decision is final.

6 No employees of Amstrad, Amsoft, or Amstrad User, nor their relatives may enter.

Win a Printer. Win a Printe Printer. Win a Printer. Win

Game of the Month

TANKBUSTERS



No, not a sequel to Ghostbusters but a innovative adaption of the classic arcade game Battlezone. In other words, a very good rip-off by those very nice Design Design people. It has more features than the original such as hidden line removal, wire guided missiles (well, joystick then) and a way of ending the game other than getting blasted or pouring Coke over the controls.

The patter on the cassette cover and in the high score are a might more colourful than this article could hope to be. This game is in the tradition of their last hit, Dark Star, and uses the same high speed loader (which even works on the 664),high score table , key definer and other bits (including the programmer and secret design studio in his bedroom)

For those people who have been living in a pit on a desert island for the last ten years, the basic plot is to manoeuvre your tank around a plain littered with cubic and pyramidal obstacles. There are other tanks on this plain which you can spot with the aid of your radar scanner. They are a bit unfriendly but are slow and can be dealt with using a single shell. The scenery is done in (flicker free) 3D wire-frame drawing from the viewpoint of the front of your tank. One improvement on the original is that the battle tanks have hidden line removal. Instead of seeing through the tank, it appears to be solid. The game ends when your shields are worn out or you have destroyed all the objects. Just one small omission from the original , you forgot the moon guys.

There is a bit of scenery in the background to the game which scrolls smoothly past and includes mountains and an erupting volcano. The mountains and volcano are in the options tables, the mountains can be made to disappear and the volcano can range from being dormant to a super-dooper 3D turbo Meagacano spurting out red stuff very realistically. What are those strange green flying squares for?

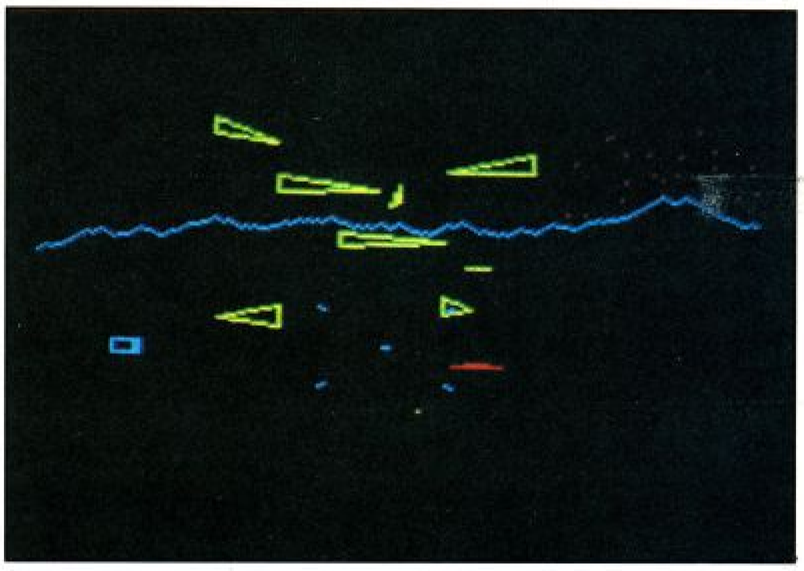
Other options allow you to use wire-guided missiles to destroy the foe as well as ordinary, boring anti-tank shells. The problem is that while you are guiding the things you are not guiding the tank. The other tanks realizing this, home in on you whilst you are in the sitting duck position and convert your tank into a piece of metallic Emintaler cheese. Not surprisingly, the enemy gets increasingly violent throughout the game but they have a sense of glory in combat and only take you on one at a time.

You can practically ensure a nice explosion by selecting an option which views things from the point of the missile, this is very dramatic. You zoom across the landscape, dodging the obstacles , until you hit a tank, an object, or run out of guiding wire. The view then snaps back to that of the tank in time for you to see all the little bits of debris bouncing around. This is very nicely done with suitable boinging sound effects.

Speaking of the sound effects, they are done in glorious technicolour stereo (when played through a speech synthesiser or your hi-fi) but are mostly of the whirr, bang, crump type. I prefer playing to AC/DC at full volume.

The game gives you a chance to recharge your shields by squatting on rotating red squares. These can be scouted for by firing off a missile and viewing the scenery rapidly. Another hint is to sit on one of these squares and blast the enemy as they come for you.

As with Dark Star, the high score table is filled with apologetic graffiti on start up and the caps shift on the keyboard is backwards i.e. you type in upper case until you press shift. The high score comes up with messages when some names are typed in. Try typing in Dark Star, Mon and Rommel (a version of the same game on a Spectrum). Telling it to go forth and multiply also gets a response.



The game has its faults, the [control] [shift] [escape] does not self destruct, overlapping objects tend to change colour and you don't get any sort of bonus for finishing, but it is very playable and promises to be better than Dark Star.

Just one last word to the authors, "Tanks for the game folks."

AUTHOR	DESIGN DESIGN
FORMAT	Cassette
PRICE	£8.95
GRAPHICS	*****
PLAYABILITY	****
ADDICTIVENESS	*****
OVERALL	*****

3-D STARSTRIKE

3-D Starstrike is not the first fly-around-in-space and blast everything-in-sight game to appear for the 464. Other games that have a similar scenario include Codename MAT and, more recently, Dark Star. Starstrike and Dark Star have a lot in common. They both begin with a flight in space during which the budding pilot at the controls must see off

the enemy ships with his laser cannon. They both include sections where a planet's surface must be negotiated, dodging the buildings and flak. And the ultimate aim in both is to blast the central building/reactor on a planet.

Having played all these games and many others of a similar genre, I have to say that Starstrike is by far the best I have come across.



The game falls into four sections: the first consists of you against the enemy ships. These come in various flavours, each type of ship being shown in beautifully smooth and fast moving wire frame 3-D. As each appears in the distance, it is not long before he sends a devastating fireball hurtling in your direction - it is more important to hit these, to save your shields, than it is to hit the point-winning ships.

In the second section of the game, you fly across the planet surface shooting at the fireballs that emanate from the ground bases. You can also swoop and dive towards the red top buildings, firing all the time - each one hit not only increases your score, but gives a very satisfying explosive effect, with debris realistically flying off in all directions. On level 2 and higher, the short red buildings are joined by much higher green towers which you can fly between. Take care not to hit one as it will send you reeling into inverted flight. The majority of the green buildings have a further yellow section on top - hitting all of these grants a very attractive bonus at the end of the section. An on screen counter is decremented for each one that is successfully dispensed with. Missing just one or two of these yellow tops invariably means that the section is ended before one can achieve completion of the bonus.

So, its on to the third section. This sees you flying down a narrow trench, the purple pyramidal gun towers firing on you all the while. To further hinder your progress, you must avoid the cat-walks that span the trench. On the earlier levels, they occur just singly - however, on higher levels, they occur in pairs (the trench is only four cat-walks deep) this sees you frantically pulling back and pushing forward on the stick to avoid the obstacles so that you may almost become flight sick with the realism. On the even higher levels (should you ever make it), the trench is filled with walls that protrude from the side walls and half fill the trench - this means that you must be as adept at horizontal control as at the vertical control.

On reaching the end of the trench, the fourth and final section should seem fairly straight forward. All one has to do is hit each of the two rotating cubic reactor pods on each side of the escape duct. Failure to do this means that you must fly the gauntlet of the trench once more, but, by this point, your shields will probably be quite depleted. Success in this fourth section allows you to fly from the planet and just before entering hyperspace for the next encounter, you are given the satisfying delight of seeing the enemy base blown to smithereens in a truly spectacular explosion, with bits of the satellite sent flying in all directions.

With your shields partly refilled, it's time to do battle with another squadron of enemy fighters. Of course, having proven yourself a worthy adversary, its just that little bit more difficult.

The game can best be played with a joystick. However, a number of key combinations can be selected. The starting level can be chosen from a list of four - I would suggest you stick to 'Easy' until you've won your wings.

For all blast fans, this game is a definite must - by far the best shoot-em-up to appear for the 464 so far. If pushed to make a criticism, I might say that the difficulty increases a little rapidly for some. A neat solution to this, might be to include the following POKEs in the loader (&2665,0 &2640,0 &2641,0). The first keeps you on the same level every time, while the second two ensure that your shields are fully replenished after every run. Unfortunately, I can't give too much advice on how to install these as it necessitates breaking the protection of the BASIC loader -however, I'm sure the hackers amongst you will find it a doddle.

AUTHOR	Realtime Software
FORMAT	Cassette
PRICE	£6.95
GRAPHICS	****
PLAYABILITY	*****
ADDICTIVENESS	*****
OVERALL	****

COMBAT LYNX



For those of you who thought Codename Mat was difficult this one is nigh on impossible. The easiest way of playing it requires two joysticks and the keyboard but it is possible to play with one joystick and keyboard or just the keyboard on it's own.

The game requires a bit of strategy to play, as you have to supply two bases with personnel from the main HQ and take back the unlucky ones. You also have to defend the bases and the HQ from enemy attack using a fearsome (and

bewildering) array of weaponry. All is lost when the bases are overrun or you have mangled all three of your choppers.

The game starts off with a number of choices for the controls. Using two joysticks leaves only the wire-guided (O.K. then, keyboard guided) missiles. On entering the skill level the game starts up to show you your head-up display and a section of the surrounding countryside.

The view is from the point on the compass nearest the rear of the helicopter. This causes the view to flick round and you to get ill every time the chopper swings round through 90 degrees. Annoying at times but it makes for fast code and you get used to it after the first three paper bags.

The first thing you do is to refuel and re-arm with rockets, machine gun ammo, cannon ammo, anti-tank missiles, anti-aircraft missiles and mines. While you are selecting your arsenal, the program displays a beautiful 3D rotating wire frame drawing of a helicopter fitted with the weaponry currently featured in the menu.

After loading up, you puzzle out which joystick does what and take off. If at this point you do not crash within the next 30 seconds you are doing rather well. There is a map which can be displayed of the countryside which shows the contours of the land, enemy and allied concentrations and so forth. Unfortunately, you don't stop moving while the map is up and if you are foolish enough to fly low at this point you get some crashbangsplat noises as you test the solidity of a hillside.

Soon you learn to spot an enemy tank, sneaking up behind it and aim .. just in time to get blasted out of the sky by an enemy fighter. To avoid this, keep the anti-aircraft missiles selected until the last possible moment. They don't need much aiming but you only get to carry six at most.

When you have the time to look at the landscape, it comes in nicely from the distance and features on the ground get bigger and smaller with distance. Eventually you get the hang of it but it is hard going though once mastered this is a very absorbing game.

AUTHOR	DURELL
FORMAT	Cassette
PRICE	£8.95
GRAPHICS	****
PLAYABILITY	***
ADICTIVENESS	***
OVERALL	****

DEATH PIT

In Death Pit from Durrell, you play the part of an intrepid explorer. You must go deep into a mine in order to find a possible maximum of 20 gold bars and a single gem stone. Points are scored for each of the bars that are returned to the tent on the surface close to where the game starts. The game is finished when the diamond is returned to the tent. At any one time, it is only possible to carry four objects, so several trips into the bowels of the Earth are required in order to succeed. While underground, a large battery shows how much power is left to light the lamp on your helmet while a large oxygen cylinder gives an indication of the remaining air that is needed to go through the submerged parts of the mine.

As well as the gold bars and gem stone, your adventurer can carry spare batteries and air cylinders, but carrying these obviously reduces the number of other objects that can be carried. Spare oxygen and batteries are to be found on the ground near the mine shaft entrance. Objects are picked up by hitting the space bar then moving a cursor to one of the four possible positions and finally using the fire button to get an object - in this way it is also possible to swap a desired object with one that is already being carried. Another object that may be carried is a spade, this is not used for digging but for despatching the various nasties that inhabit the mine.



While on a connecting ladder, one must turn side ways for this defence to be active, so it is often necessary to stop your ascent or descent and move momentarily to one side when an undesirable approaches. In play, you wander relentlessly around, along the tunnels and up and down ladders, trying to find the gold and gem. The baddies occur in two types, those who are suspended from the ceiling of the tunnels (spiders) which appear occasionally and those that can move about freely (scorpions and another type of spider).

The area of play is confined to a relatively small window, which is updated each time you walk out of one edge. In many respects, this game is similar to Roland on the Ropes. Both consist of large mazes populated with baddies and desirable trinkets. But, unfortunately, this game is nowhere near as good. The control does not seem to be as accurate and the part of the map shown does not scroll as one moves, which is a shame. The business of oxygen and batteries just seems like an unnecessary confusion as is the time limit that counts (reasonably slowly) up to 9999 at which point our hero expires.

The monotonous, repetitive tune that drones on in the background might as well not exist. It will very soon be turned down anyway. Another drawback of the game is the fact that the maze and location of objects within it is always identical, so once mastered, this game could rapidly lose appeal. This game does not really match the usual standard of games from Durrell, I think I'd spend my hard earned pocket money on Combat Lynx every time.

AUTHOR	Durrell
FORMAT	Cassette
PRICE	£8.95
GRAPHICS	***
PLAYABILITY	**
ADDICTIVENESS	*
OVERALL	***

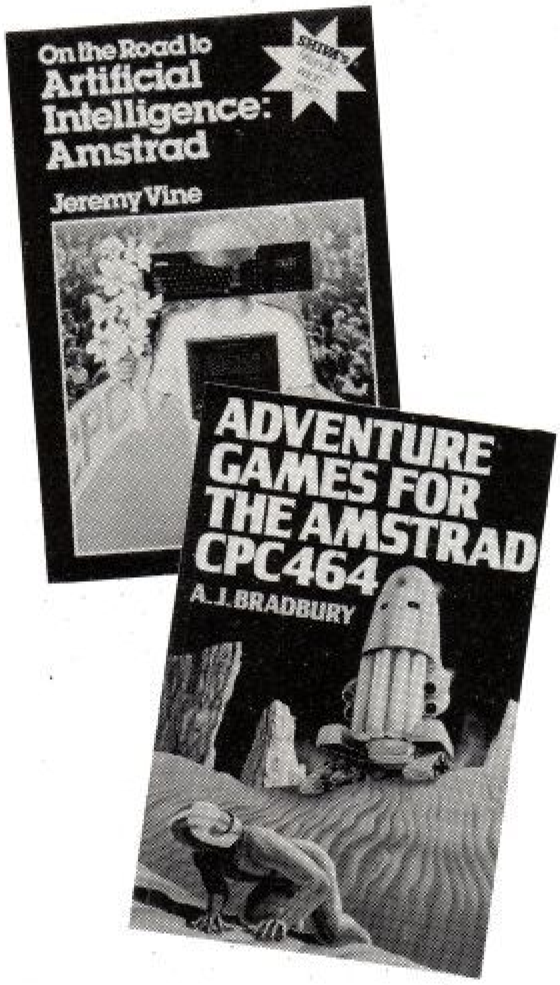
ACU

BOOK REVIEWS

Peter Green

On The Road To Artificial Intelligence: Amstrad CPC464

Jeremy Vine
Shiva Publishing
ISBN 1 85014 064 2
102 pages
£5.95



These titles don't get any shorter, do they. I don't think this one is too accurate, either. My dictionary defines intelligence as 'intellect: quickness of understanding'. Intellect is 'the faculty of knowing and reasoning'. Current computer technology, be it an Amstrad micro or a Cray supercomputer, fails all of the above tests. A computer knows nothing; it reasons only in the sense that it will produce results from data using its list of rules (but so does a pocket calculator); it has no understanding.

In essence, any computer is just a collection of switches that can be on or off. The switch states represent numbers, and can be altered using rigid rules fundamental to the hardware design. A machine code program is just a list of these rules. We can use the numbers to represent objects in the real world, and model physical and mathematical processes with suitable choices of rules to manipulate the numbers. But the whole process is completely predictable: given the initial state of the computer, we can always calculate the end state. It happens that by far the quickest way of obtaining the end result is to actually run the program, which is why we build and use computers. It just isn't sensible to talk about computers being intelligent.

The author himself questions the validity of describing computers as intelligent, but fudges the answer a bit. The trouble is, artificial intelligence is a nice buzzword with sales impact. A more honest title would have been 'On The Road To Faking Intelligence', but it wouldn't have looked so good on the bookshelves.

Please don't think I'm attacking Jeremy Vine over the content of his book, because I'm not. It's just the labelling of it that bothers me. The book itself is actually a good guide to the techniques of text handling – the sort of thing that is so useful in up-market adventure games which allow very complex commands to be input and acted upon, or in the development of a really friendly user interface for a piece of business software.

All the BASIC keywords for manipulating text, such as PRINT, INPUT and the string-handling commands are covered in some detail, and much useful advice is imparted on good programming technique.

The book closes with two long example programs. Sigmund is a version of the psychoanalysis program which takes the 'patient's' input and chooses some very convincing responses which, at times, really do seem to constitute a conversation. Interviewer is a version of Sigmund which conducts a job interview. Both programs are impressive – at times you could believe a real person is answering you –but please, Jeremy, don't describe the replies as intelligent. They are sensible, which not the same thing at all.

Adventure Games For The Amstrad CPC464

A.J. Bradbury
Collins
ISBN 0 00 383078 0
229 pages
£7.95

When I used to work on a computer magazine, the office was inundated each month with copies of books from all the major publishers: far more than we could possibly review. Often we'd get a string of similar books from an author, each with a different computer in the title. We'd joke in the office about these authors having good search and replace facilities on their word processors.

This book falls into that category, but I'm afraid the author has very bad search and replace. It's a version of a previous book written for BBC owners: I can tell because large chunks of BBC material have been left in. For example, he keeps talking about storing numbers in 'resident integer variables' because CHAINing a program corrupts the variable area. This is true on the BBC but nonsense on the 464. (Anyway, it has no RIVs). He talks about using ? to access memory directly: this, too, is BBC, as the 464 uses PEEK and POKE.

Page 201 states that arguments for user-defined graphics must be hex values: this is nonsense on either computer. I typed in the Boolean operator demo on page 33 exactly as listed: it does not work as described, although the preface states that all listings in the book have been listed from tested programs on the Amstrad.

This is clearly not true.

In short, the preparation and editing of this book are completely inadequate. It's a pity, for many of Mr. Bradbury's comments on the actual structure and techniques of adventure game programming are thoughtful and relevant. I'd disagree with his preference of gridded paper to the boxes-and-lines method of constructing adventure maps – the latter is much more flexible and not as prone to error as he suggests – but that's a matter of opinion. But whatever the merits of his adventure theory, how can I possibly recommend a book which doesn't even know which computer it is describing.

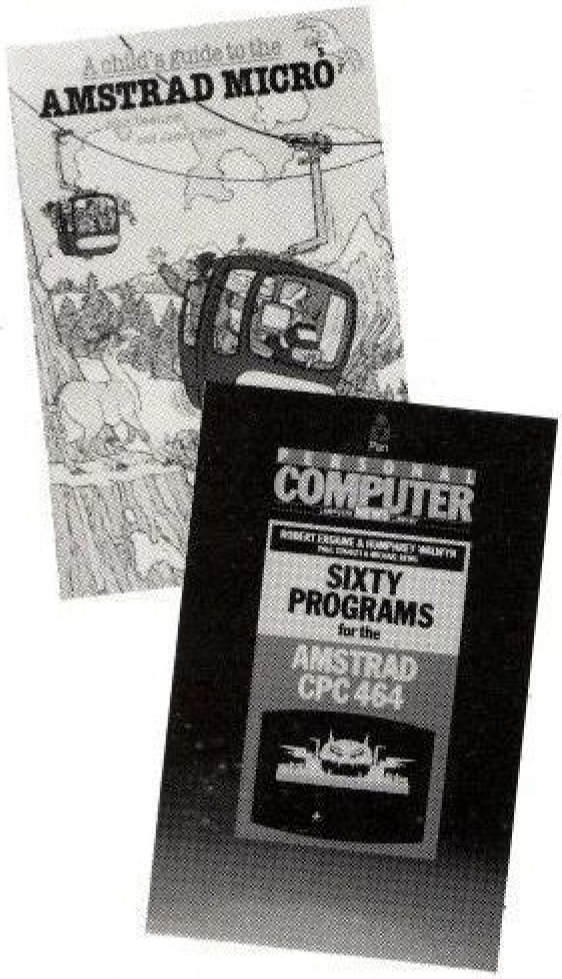
Collins have made me angry. I can understand publishers trying to make profits from the home computer boom, but if they sacrifice quality and accuracy just to get their snouts in the trough, they are treating you, their customers, with contempt. If you've already bought this book, complain. If you haven't, look elsewhere. Voting with your wallet is the only way to get the books you deserve.

A Child's Guide To The Amstrad Micro

John Dewhirst and James Ryan
Cambridge University Press
ISBN 0 521 31561 1
96 pages
£3.95

This book is aimed at the younger programmer – there's no age range mentioned on it but I'd say pre-teens would be a fair estimate. Thus the print is relatively large and simply-written, and there are numerous cartoons scattered about to break up the text. Many of these feature the five characters used to present each of the sections: PC Bobby Truemo who tracks down program errors, Mortimer Puce the artist, and Ms. O.C. Termup, the reference librarian.

This is a good idea, as kids love to have silly names and characters like this, but together with the 'You try' boxes, the 'Display box' showing the result after you type an example, and the 'Make a Note' boxes, the layout gets a bit cluttered at times. Nevertheless, the treatment is at a very basic level and the dimmest of computer illiterates should be able to gain from it. It might even be more suitable for the 'truck driver and his wife' that Alan Sugar (pause to tug forelock) aims his computers at – I'm getting worried at the number of 12-year-olds who seem to know more about machine code than I do.



Sixty Programs For The Amstrad CPC464

R. Erskine, H. Walwyn, P. Stanley and M. Bews
Pan Books
ISBN 0 330 28764 8
303 pages
£5.95

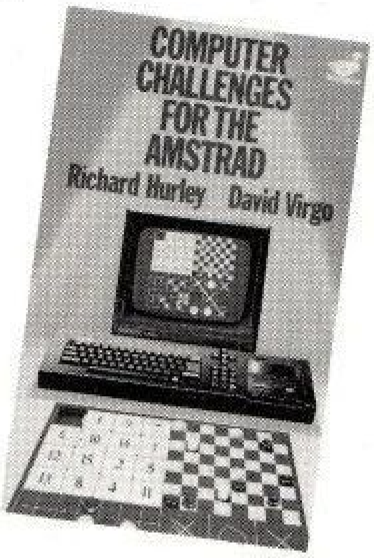
If you like games and love typing, this book will give you many happy hours. A thick tome containing nothing but program listings to type in, covering just about every conceivable game and one or two more serious topics. It's impossible to really review a book of this sort: all I can say is, I dipped in at random and got a simple Galaxian program which worked first time. At 10p a listing, how can you go wrong?

Computer Challenges For The Amstrad

Richard Hurley and David Virgo
Duckworth
ISBN 0 7156 1979 9
212 pages
£6.95

Here's another book which claims to contain artificial intelligence programs. The authors justify themselves with this definition: '... the combination of methods employed in programming in order to make a computer solve or attempt to solve a problem by selective reasoning'. That sentence contains its own refutation –because computers do not reason. It is the programmer who does the reasoning when he analyses the problem and writes the program, which the computer then blindly, mechanically, and predictably follows.

Nevertheless this does not reduce the value of the book, which is actually about puzzles and games programs. The material used is rather more up-market than the usual kill-the-alien listings books, however. The first half of the book offers four puzzles in which you try to solve problems which use the computer simply as a passive display device. For example, the famous sliding puzzle (buy one for £1400, and get a free Macintosh) starts off the section, and is followed by an on-screen Rubik Cube for you to solve, a crossword puzzle with a database as big as you want, and that classic found in every magazine article on recursion, the Towers of Hanoi.



The second section makes things a bit trickier for you, because it contains two-player games with the computer as your opponent. This can often give you a run for your money: not because the computer is intelligent, artificially or otherwise, but because it is better and faster at blindly following rules. The games covered by this section are Othello, Noughts and Crosses, cribbage, backgammon, draughts, and Connect 4.

The two authors are both lecturers in computing at a Sussex College, so the programs are well-written in neat, structured blocks. Flowcharts and diagrams abound. A short section near the beginning of the book describes the keywords from the Amstrad's Locomotive BASIC used in the programs, and provides simple examples to back up this tuition: so beginners need not feel lost. The listings are often several pages long but on page 214 of the book are details of a cassette, also available from Duckworth, which contains all the programs described in the book and costs £7.95. Not bad value for 10 games.

Practical Programs For The Amstrad CPC464

Owen and Audrey Bishop
Collins
ISBN 0 00 383082 9
172 pages
£6.95

If you're the sort of the person who likes to type in listings, but also likes a detailed description of their workings, this book is for you. The Bishops are noted authors and contributors to computing and electronics magazines, so when they say all programs are listed from a debugged and working Amstrad program, I think we can take them as accurate even if Collins are the publishers. Certainly I was unable to find any errors in programs or text. Furthermore the Bishops take great pains to describe the most probable typing errors you'll make, such as mistaking lower case l, capital I and the number 1 for each other. If the programs don't work, it's probably your fault.

There's a pretty broad spectrum of programs here, 14 in all, and aimed at practical and serious, though simple, applications. Statistics feature prominently, with a Pools program, trend analysis, statistical deviation and decision analysis. Home owners can type in listings for planning space layouts, checking cashflow with a simple spreadsheet, doing accounts and watching the call charges accumulate while making phone calls. There are several varieties of database, and a Supersound program that makes it easier to develop sounds using the complex Amstrad SOUND command.

An Amstrad CPC464 Compendium

Martin Gandoff and Robin Kinge
Addison-Wesley
ISBN 0 201 15439 0
168 pages
£7.95

This is another games compendium, a collection of 22 listings in Locomotive BASIC for a whole variety of games, from traditional to modern, from games of skill to games of chance, plus a set of short graphics programs for amusement and a screen drawing program. The introductory chapter skims through the BASIC keywords, and it's rather worrying that the authors are completely in error about the way SYMBOL AFTER works: I hope the listings were checked properly.

The listings have a minimum of explanation, but they are printed in big, heavy dot matrix lettering which will be easy to type in. Better, each game has a screen photograph so you can see what you're getting before you enter it (or buy the book!). This is unusual in listings books and is to be encouraged.

Amstrad Magic

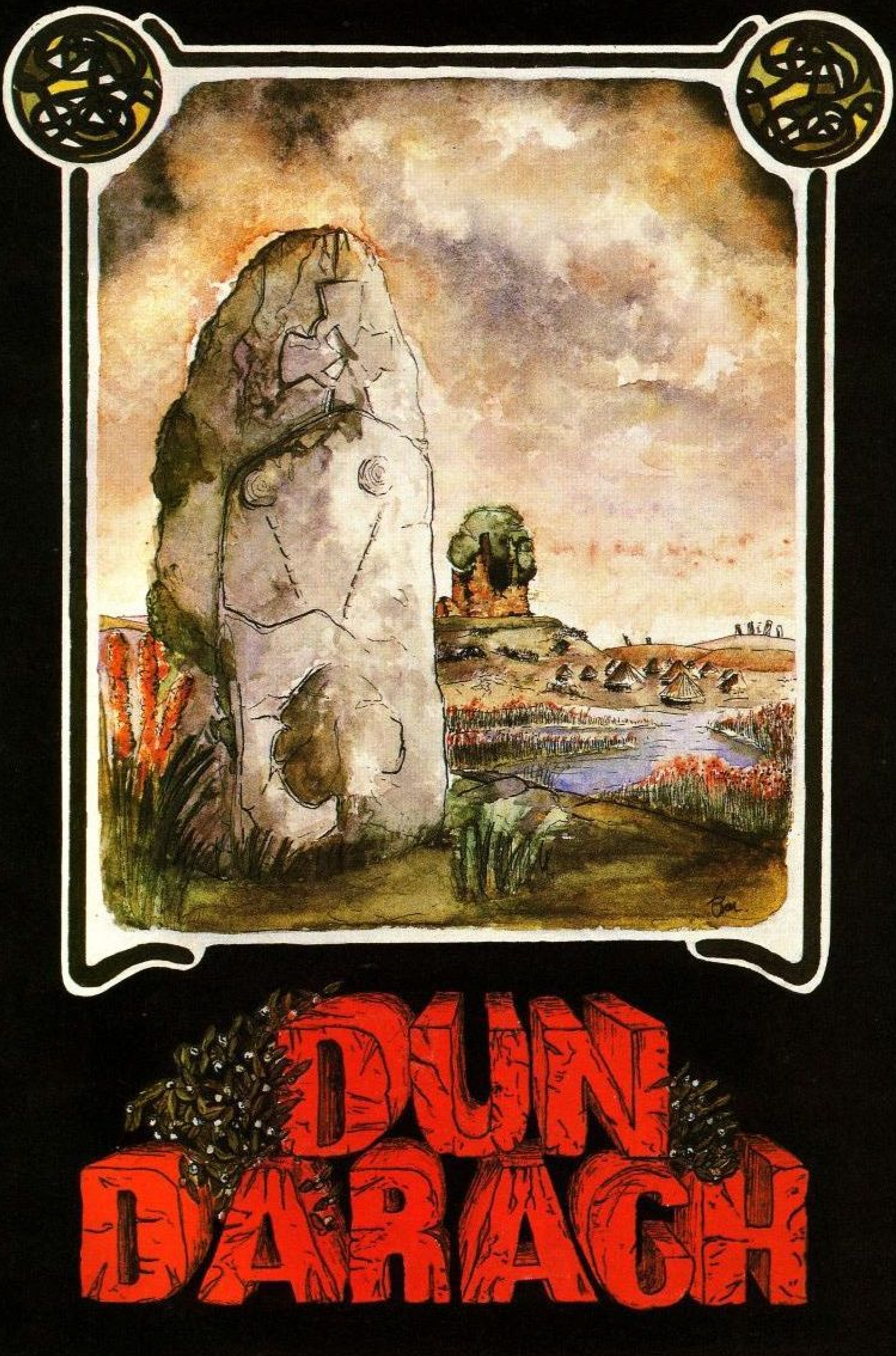
Edited by Jack Walker W. Foulsham & Co Ltd
ISBN 0 572 01297 7
96 pages
£5.95

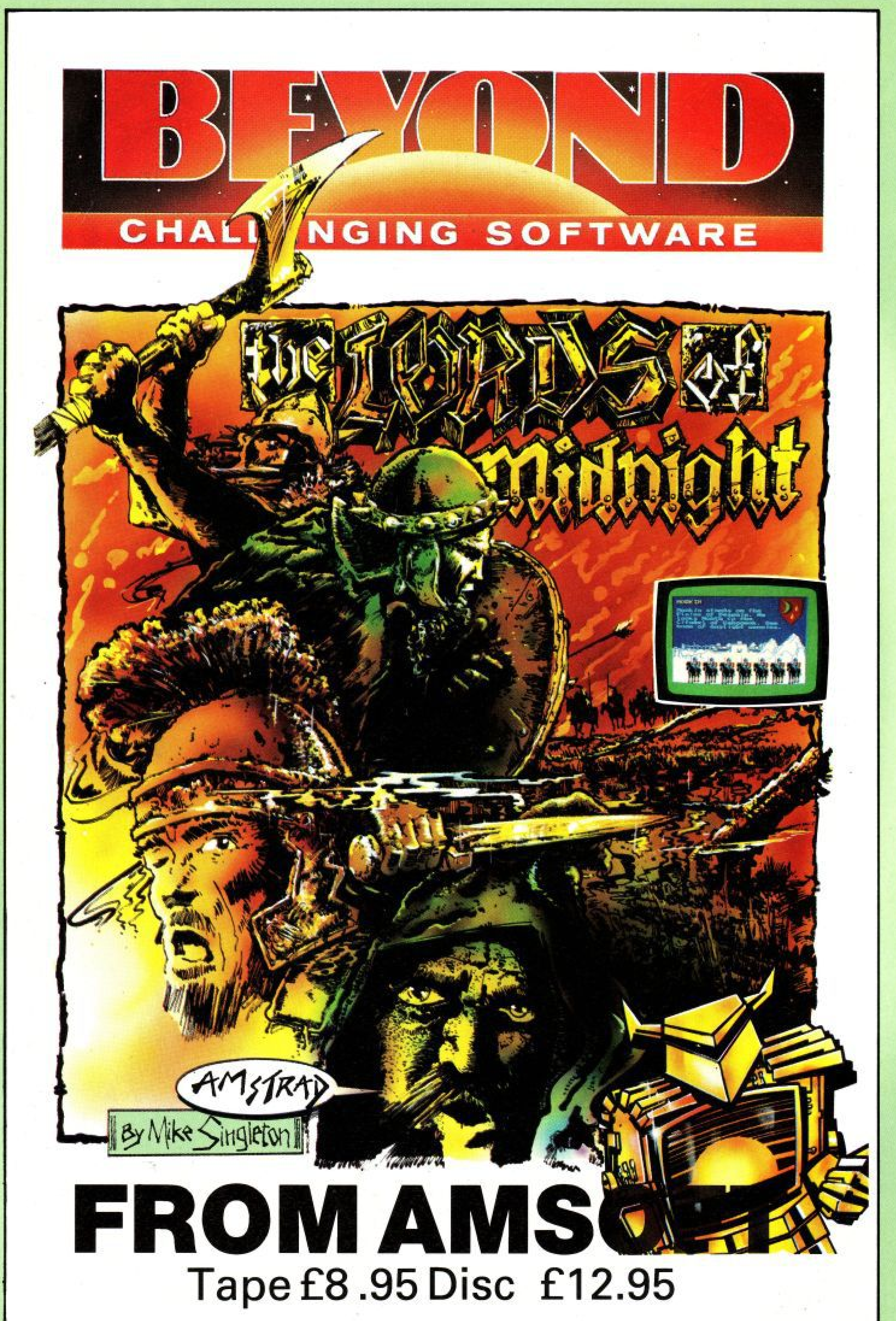
The subtitle of this book is 'Your First Programming Book' and it is another one aimed at the younger programmer, or absolute novice. It goes into a great deal more detail than 'A Child's Guide...', because the print is smaller and there are only a few cartoons included. The page layouts are also much neater and the book is easier to follow. However, a young child could well find the denser text more daunting to wade through: parent's will have to judge which level of book would be more suitable for their offspring.

As well as lots of short examples scattered through the text to illustrate points as they arise, an appendix gives two complete programs, a Mastermind type and our old favourite, the Towers of Hanoi. A useful book to keep your more thoughtful kids quiet during the holidays.



ACU


DUN DARACH

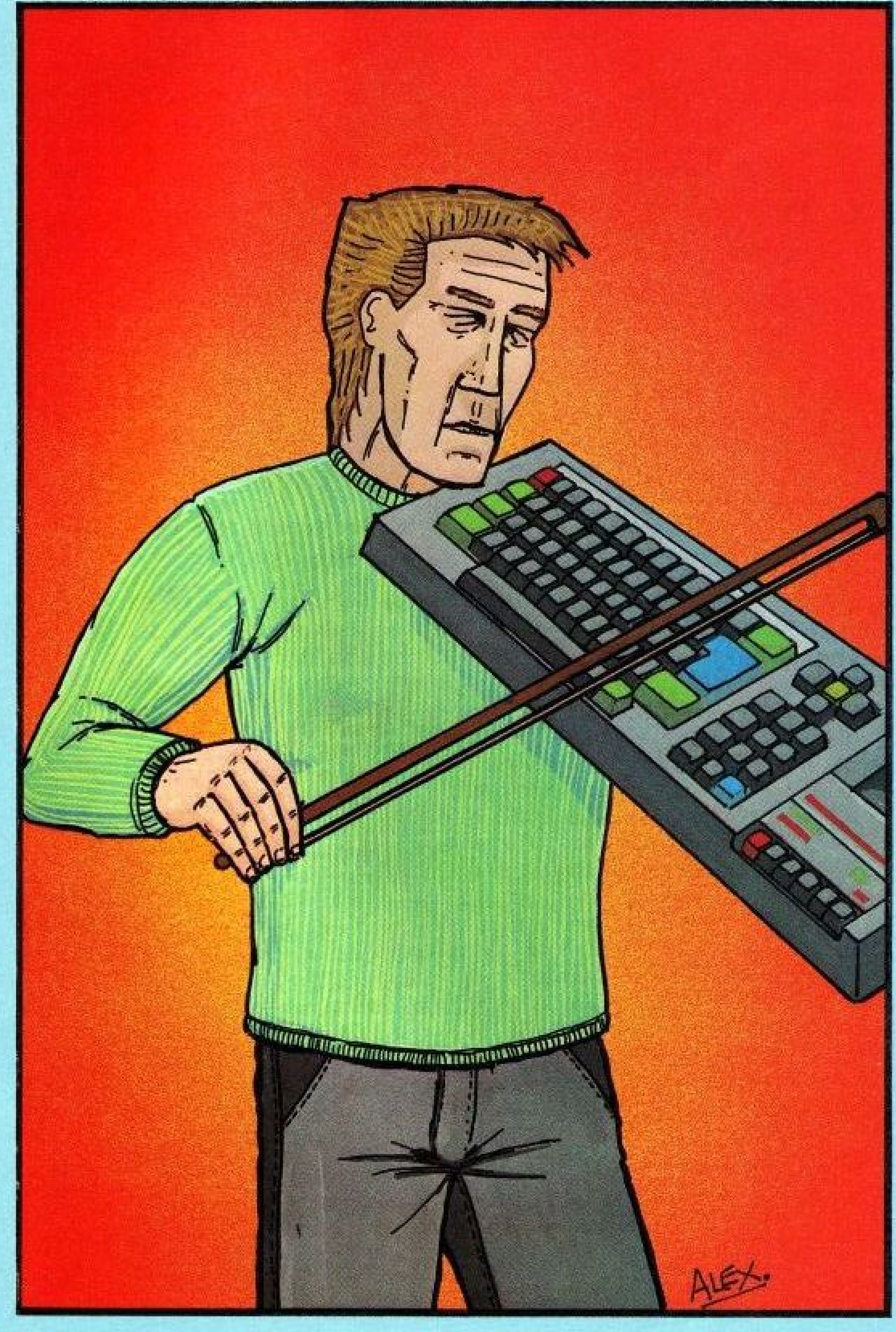

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THE MUSICAL AMSTRAD Part 5

JEREMY VINE

This month sees that last of the present series about music on the CPC464 (and of course now, the 664!), so I thought I'd complete the musical story by looking at a few ideas which utilise the micro to good effect. The Amstrad can be used in many ways and it's not only for sound effects of background 'tunes'. As this is the last of the series I'm going to consider a number of ideas for music programming - not all of them immediately obvious - and also look at how the Amstrad can be used in conjunction with other musical instruments.

Using a computer to produce music is great fun in itself, but how useful is a micro, even if it is an Amstrad? Considering the limitations of the sound chip, the sounds that can be created are impressive. But after formulating a lazer-gun zap or an explosion, you might begin to wonder whether there is anything else you can do. Well, there is.



Throughout the past few months, I've tried to show that even if you're not a musician, you can still create music. However, true creative works are the realm of the composer and it's one area that most of us wouldn't even attempt to aspire to. So wouldn't it be nice if your Amstrad could compose music for you?

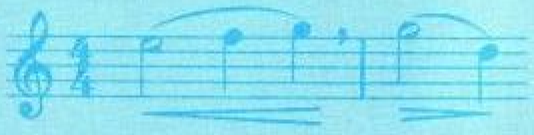
The Composing Computer?

The idea of a composing machine or some way of reducing the composing process is not new and delving into the musical history books reveals various attempts at relieving the musician of the need to spend hours on end, manuscript paper in hand, composing. The problem, however, seems as impossible as answering the question of how we learn language. It's all a case of: what makes a good tune?

Over the years, music has not followed one straight road and this is shown by the diversity of music in different cultures. In the West, music has for many centuries followed a recognisable form that differs greatly from, say, Indian music. To our ears, Eastern music often seems unharmonious but this is because of the way we have become used to a certain set of fixed interval sounds. If you look at your User guide, you'll see a list of frequencies of sounds and their related pitch names (ie C,D,E, etc).

This forms the basis of most written music and if composing from a piano keyboard, the musician is limited to the range of semitones present. From this, we have developed the multitude of compositions and musical styles we know today. But music isn't limited by these restrictions. It is always important to remember that what we are doing with music is merely juggling a set of different sounds frequencies and hopefully ending up with something our ears find pleasing.

Now all that may seem very interesting but what's it got to do with computing? A lot, if you intend to teach your micro to compose. Because the micro is basically very thick, we have to teach it how to compose and that is not as easy as it sounds. Unlike writing a games program, where the purpose and final results are already known, a program that might compose



music has no known end-result, except that some noise will be made. An understanding of the rules governing music is essential but as I said earlier, 'What makes a good tune?', and that unfortunately is not easy to answer. What is worse, is that there are no rules governing composition. So when in doubt, turn to Mozart.

The most famous example of an auto-composing method was formulated by Mozart (now known as Amadeus due to his recent Oscar winning success) and was called the 'Musical Dice Game'. It is ideally suited to computer conversion as it uses that old favourite of the silicon machine -random numbers. However, despite the genius of Mozart, the end result is far from inspiring and in no way compares to compositions of the mind. But it does provide us with a set of rules by which compositions of a certain character can be created. These rules can be converted into programmable form and the techniques discussed over the past few months can be put to full use.

In its own way, composing by micro is both exciting and surprising. I have not included a 'Dice Game' program here because of the sheer length of code involved - the vast amount of code is musical data, rather than any complicated programming technique. You can of course try to create your own random music generators using the RND function but the first pitfall is the clash of subsequent notes causing usually (unless you're really lucky) a perfectly horrible inharmonic noise.

To get over this problem a few simple rules can be applied. Firstly, use different durations but not too many (two would be best) as this will add rhythm into the music. Different instrument sounds will also detract from the randomness of the notes generated and, finally, apply a strict rule that eliminates repetition of notes or clashing unharmonious sounds.

An ear for Music?

Virtually all music programs written for micros that I have seen have involved a knowledge of music and make little or no attempt at tech music. I suspect many of you reading this have no background in music but, like most people, still enjoy music. The Amstrad is the ideal tool with which to learn the language of music. Patience is a great asset in any teaching situation and the micro is well utilised in this area.

It is easy to write programs that test both the visual and auditory senses. The first hurdle faced when learning music is to understand all those funny dots and lines, so why not use the computer? An excursion into the graphics commands is needed but this need not be more than drawing five horizontal lines and placing a 'blob' on or between lines. The position of the 'dot' is directly relative to a note name and this information is easily stored in a DATA statement.

Even if you don't understand music, the position of notes can be copied from a music notation book and a simple question and answer program is virtually finished.

The same idea can be applied to testing knowledge of scales and key signatures. But visual tests are not all that can be programmed. Using the 'C major' program from April as a basis, extend the DATA statements to play all Major scales and randomly play any scale. Provide a 'pitch-fork' tone as a guide ('A' is usual) before playing the scale and then see whether you can work out the scale. The same goes for testing the pitch of individual notes and it is easy to elaborate the process to make the task seem less learning orientated and more game-like.

The same principles can be used in a random rhythm generator. In May's article I converted the musical duration times into values that the Amstrad can understand. It's not hard to extend that into a program generating a beat (you need only use SOUND statements).

Scintillating Synthesising!

And now a few thoughts on interfacing the Amstrad with other machines. As a music machine the Amstrad is impressive but in no way compares to the likes of a professional synthesiser. However, there are options which you might like to think about. As a noise generation box the Amstrad may well have uses in the background but where it could really score (excuse the pun!) is in controlling other instruments.

Compatibility is one word that is often used in computing circles but rarely exists. In the world of the professional musician, similar problems exist but one important standard is the implementation of MIDI. MIDI (Musical Instrument Digital Interface) is a means of linking musical equipment together and causing synthesisers, drum machines etc, of different makes to work together. The added bonus is that because of the nature of the MIDI interface (essentially a serial device), micros can be connected into the 'circuit' and used as the controlling unit. The computer can then act as a recording studio and outputting the information to the relevant machine.

'Great', I hear you cry. But there's a catch. At the time of writing this article, I haven't heard of a MIDI interface for the Amstrad. They are just appearing for other micros and it would seem likely that the Amstrad machines will soon have MIDI. The 664 in particular is ideal as the disc drive can store the vast amount of data needed. This is because synthesisers have many different 'events' occurring simultaneously and much information is contained even in the production of one note.

The uses of MIDI is only just being explored and I hope that we will soon see the use of synthesisers and computers, side-by-side, in performance. Synthesisers are coming down in price and it's not inconcievable to think of a computer controlled band.

And finally...

And finally, I've given over the past few months a lightening tour around the Amstrad sound chip which is a pleasure both to program and to listen to. I hope that the intricate nature of the sound commands are no longer a mystery and if you're a muscial novice, that music itself is not as frightening as you might have imagined.

I haven't concentrated on giving you loads of sound effects as the series has been in the main about music and it's fun anyway to try your own effects. But I bow to pressure for giving some sound effects so here's a few that I have used for my amusement, games etc. I won't tell you what they - you'll have to type them in and see.

Program A.

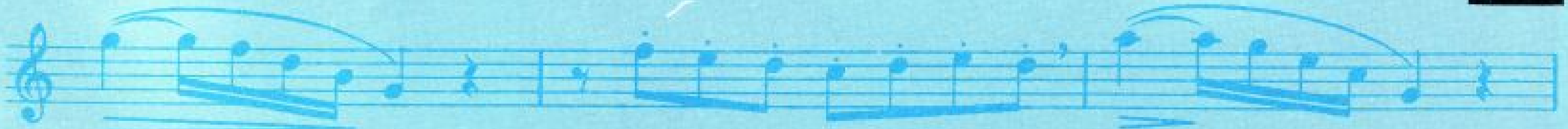
```
100 FOR mystery = 50 TO 150
110 SOUND 1,mystery,3,15,0,0,0
120 NEXT
130 FOR loop = 0 TO 45
140 SOUND 1,1,3,15,0,0,31
150 NEXT
```

Program B.

```
100 ENV 1,100,122,1
110 SOUND 1,239,0,15,1,0,0
120 FOR y = 0 TO 2000
130 NEXT
140 GOTO 110
```

And that really is that. This is the last of this series for the time being but not the end of music on Amstrad machines. The exciting part of using the sound system is the unexpected variety of new sounds possible and that's where you come in. Play around, experiment -don't be afraid. You might keep the neighbours up nights but who knows what sound you'll discover. And if it's good, send it to us so that we can all listen.

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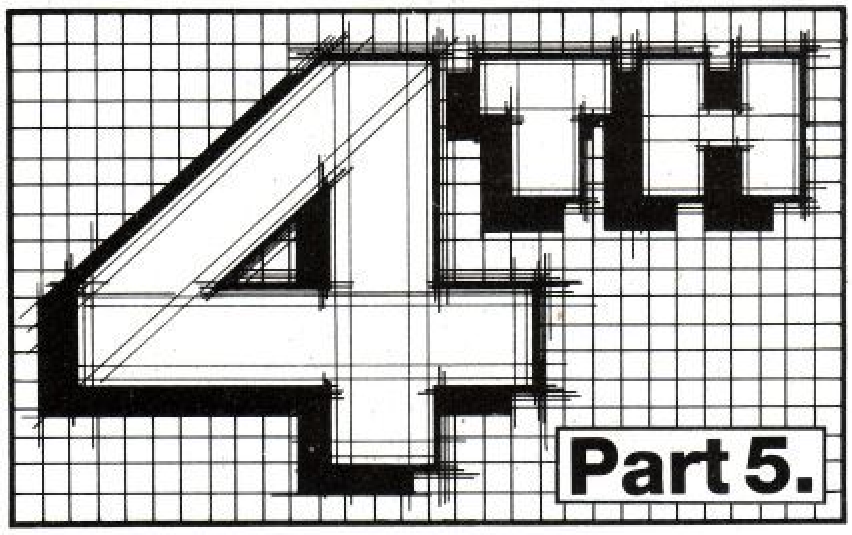
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Input and Output

We have already seen in previous articles how numbers are input to the stack, by simply just entering the number, and also how numbers are output from the stack by using the FORTH word '.' (dot).

When it comes to the handling of strings of characters, FORTH is very much a 'do-it-yourself' type of language. There are no string variables as in BASIC, and therefore no string handling words such as LEFT$,RIGHT$,MID$ etc. However, as with most things in FORTH, the bare essentials are all there and it is up to the user to incorporate what string handling words are considered desirable.

The first text handling word is EMIT. This will print out the number that is TOS as its ASCII equivalent. So 65 EMIT would print out 'A'.

To print out the word 'YES' you could say:

```
83 69 89 EMIT EMIT EMIT
```

and this would do the trick. You could define a new word to print out 'x' number of characters from the stack with:

```
: DISPLAY 0 DO EMIT LOOP ;
```

All you need to do now is to specify the number of characters that you want printed out from the stack. For example, 3 DISPLAY would print out the word 'YES', assuming that the three numbers 83, 69 and 89 are on the stack of course. As we shall see though, there are better ways of outputting text than this.

EMIT is not just restricted to the ASCII characters though. The codes from zero to 31 can also be used, which is very useful. For example, if you turn to chapter 9, page 2 of the User Instruction Manual, you will see the list of control character commands that are available. To sound the 'bleeper' in BASIC you would have to say:

```
PRINT CHR$(7)
```

In FORTH you could make this rather more user friendly by defining a new word called naturally enough...BLEEP:

```
: BLEEP 7 EMIT ;
```

Any time you need the keyboard bleep, then just type BLEEP...simple! English could be defined to turn the transparent mode on and off:

```
: TRANSPARENT-ON 1 22 EMIT EMIT ;
: TRANSPARENT-OFF 0 22 EMIT EMIT ;
```

A word to print inverse characters is easily defined by:

```
: INVERSE 24 EMIT ;
```

You could create other words just as easily for the other control characters depending upon your needs. This is a good indication of how 'user-friendly' FORTH can be if you use appropriate names for the new words.

If you have a printer, EMIT is a Godsend! To set boldface type on my Daisywheel in BASIC would need:

```
PRINT CHR$(27);CHR$(87);
```

In FORTH you would say:

```
: BOLDFACE 27 EMIT 87 EMIT ;
```

All you have to do now (assuming the printer is 'LINKed') is to type BOLDFACE and the printer is set to boldface. Setting the line pitch in BASIC, to say 1/8th inch would need:

```
PRINT CHR$(27);CHR$(30);CHR$(6);
```

The setting is given in 1/48th inch increments - hence the 6 at the end. In FORTH it could be:

```
: LINE-FEED 27 EMIT 30 EMIT EMIT ;
```

So now 6 LINE-FEED would set the linefeed to 1/8th of an inch. 16 LINE-FEED would set it at 1/3rd of an inch. Once again...very simple and very user friendly.

The opposite to EMIT is KEY. This waits for user input from the keyboard and places the ASCII value of the key that is pressed to the TOS. If you try:

```
KEY .
```

and then press [ENTER], FORTH will wait for you to press a key, and then print it's ASCII value. KEY is normally used for testing that a certain key, or combination of keys, has been pressed in response to a prompt such as 'PRESS [ENTER] TO CONTINUE'. You could then use a new word,

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	Total goods value at £45.89 per Ten-Pack inc VAT	______
	Total post & packing at £1.15 per Ten-Pack inc VAT	______
	Value of cheque to 'disking' (or credit card No. below)	______

Please send me your full catalogue of diskettes, Coloured diskettes and diskette accessories tick here ....

Name: ....

Address: ....

....

....

Tel No: ....

or please charge my credit card No: ....

Access VISA & Diners cards welcome

We stock Verbatim, Memorex, Dysan, Maxell and Coloured diskettes, and we sell all diskette accessories including storage boxes and cleaning kits - please telephone for price list or see our double page spread in Personal Computer World.

say TEST-KEY to test for the key pressed:

```
: TEST-KEY BEGIN KEY 13 = UNTIL ;
```

Placing the word TEST-KEY in a program would suspend the program until the ENTER key is pressed. A string of characters could be input using a loop as in the new word GET-WORD:

```
: GET-WORD BEING KEY DUP DUP
  EMIT 13 = UNTIL
  DROP ;
```

This word will accept text input and place the ASCII values onto the stack until the ENTER key is pressed. The DROP removes the value for the ENTER key which is not required, and EMIT will 'echo' the keys that are pressed to the screen. The characters on the stack could now be tested and manipulated as required. Of course, this word is still far from perfect. What happens if the backspace key is pressed, or the ESC key? The values will still be placed onto the stack, when they are not required. Although making up these various types of words may seem to be easy at first glance, making them foolproof involves a lot more work. Just as in BASIC, a large part of the program may consist purely of foolproofing techniques. There is not enough room in these articles to cover foolproofing, but hopefully you will modify some of the words to cover this aspect.

A more general FORTH word used for inputting text is WORD. This will take the ASCII value on TOS and read in characters up to this delimiter value. Its main use is to 'look ahead' at text. The FORTH word -FIND uses WORD to search the dictionary for whatever word follows. If you wanted to see if the word SWAP exists (which it does!) then you would use:

```
-FIND SWAP
```

The delimiter value in this instance is a space, which is of course the main delimiter value used in FORTH. If the word is found in the dictionary, then a true value (1) is placed on TOS followed by the length of the name, and the words PFA (see last months article). If the word is not found then a false value (0) is put on TOS. You could make up a word to return the details as follows:

```
: WORD? -FIND IF DROP ." PFA ADDRESS IS " .
  ELSE ." WORD NOT FOUND " ENDIF ;
```

Now WORD? will search the dictionary for the word that follows and print out its PFA if the word exists, or tell you that it could not find the word. Bear in mind that -FIND will only work on the FORTH VOCABULARY and the current VOCABULARY if this is different from FORTH. If, for example the current vocabulary is FORTH, then WORD? CPIR will return 'WORD NOT FOUND'. The word CPIR does exist in the ASSEMBLER VOCABULARY though, so you would need to type ASSEMBLER firstly, and then WORD? CPIR. This time the word will be found and its PFA address printed out. Next month's article will take a closer look at using the FORTH ASSEMBLER.

WORD can be used to input stings of characters directly to the dictionary. At compile time the string that is input is stored from HERE. HERE is a FORTH word that points to the next free memory in the dictionary. The first byte of the string will contain the string length once WORD has completed its routine. This can be used to set aside the required number of bytes to store the string into the dictionary, and to increment the dictionary pointer HERE accordingly.

We can create a new defining word IN$ which at compile time will store the string that is input into the dictionary, the first byte of the string being the length of the string:

```
: IN$ <BUILDS HERE    ( Save address of HERE on stack )
       13 WORD        ( Accept string until <ENTER>   )
     c@ 1+ ALLOT      ( Get string length & allot     )
     DOES> ;          ( PFA to stack at run time      )
```

This uses the <BUILDS and DOES> as described in last months article. The address of HERE is saved onto the stack first as this address will hold the length of the string. 13 WORD will then accept the string up until the ENTER key is pressed. The length of the string is then returned by C@ and 1 is added to this to take into account the first byte of the string which will be the length byte. The FORTH word ALLOT will then move the dictionary pointer HERE by the length of the string plus one. To see how this works, first enter the new defining word IN$. Now if you wanted to create a string called 'OPTION-1' which was part of a list of options, you would say:

```
IN$ OPTION-1 A - Display Menu of Chord Shapes
```

Now IN$ is a defining word so it will compile the next word, OPTION-1 into the dictionary. The <BUILDs part will store the string 'A - Display Menu of Chord Shapes' into the dictionary. Now that the string is in memory we need a way of printing it out or performing other operations on it. The first FORTH word of use is COUNT. If the address of the string is on TOS, then COUNT will place the length of the string on TOS. Note that the first byte of the string must be the length byte for COUNT to work correctly. The word TYPE will then print the string of characters given by the length and address of the string. If you have compiled the above string into the dictionary then OPTION-1 COUNT TYPE will print out the string. Remember that the DOES> part of IN$ puts the PFA of OPTION-1 on TOS when the word is run. The PFA of OPTION-1 contains the length byte and the string, which is then used by COUNT and TYPE.

You could create as many strings as memory allows if needed with IN$. Once you know where the string is located in memory it is fairly easy to perform other checks on it. Words to simulate RIGHT$, LEFT$, MID$ etc can be created if desired. However, it would take up all this magazine to give examples and there are many other points to cover.

Formatted Output

On the better BASICs, PRINT USING is available for formatted output. FORTH has some very useful formatting words which work on numbers that are output. If you were to type in the number '123', it is the FORTH word NUMBER that turns the string "1" "2" "3" to binary and puts it on TOS.

In this case a 16 bit number is generated. If NUMBER finds a decimal point anywhere in the string, then a 32 bit number is generated. The first of the formatting words is .R and D.R which print a 16 bit and 32 bit number right justified by the value specified. If you try the following two words you will see how this works:

```
:  TEST1 10000 1000 100 10 0
        5 0 DO CR . LOOP CR ;
:  TEST2 10000 1000 100 10 0
   5 0 DO CR 5 .R LOOP CR  ;
```

Try changing the value before .R in TEST2 to 40 and the numbers will be printed out halfway across the screen in 80 column mode.

Other formatting operators are available but these must be placed within the two words <# (start formatting) and #> (end formatting).

The number that is to be formatted must be a double number. The word S→D will convert a 16 bit number to a 32 bit number if required. Putting the value of zero on TOS will also have a similar affect The formatting words to use between <# and #> are:

```
#S # HOLD SIGN
```

These words convert the double number to a string which is generated downwards from PAD, which is a scratchpad area always at a fixed offset above HERE. After generating the string, the address of the string and its length are left on the stack. Using TYPE, as before, will therefore print this string out. Try the following new word which will take a double number on TOS and print it out as pounds and pence:

```
: MONEY
  <#        (start formatting)
   # #      (convert two smallest digits - pence)
   46 HOLD  (insert `.' into the string          )
   #S       (convert any remaining digits        )
   163 HOLD (insert the pound sign into string   )
   #>  ;    (end of formatting                   )
```

Now if you were to enter 123. MONEY TYPE the string printed out would be '1.23 - remember that the decimal point after the 123 is to signal that the number is a double number. Let's see how this works. The # word will divide the double number by the current BASE to generate the first character. Working in decimal (BASE 10) this would give 123 divided by 10, which leaves a remainder of 3 - the first character of the string. The number left, 12, is then divided again by the the second # word. This gives a remainder of 2 - the second digit of the string. This takes care of the pence. The word HOLD takes the value that is TOS and inserts its ASCII equivalent into the string - in this case the decimal point. The word #S converts the number remaining in the same way as #, until there is nothing left to convert. The pound sign is then inserted into the string by using HOLD. There is one problem with the word as it stands. What if a negative value is input? If you try it with MONEY the result is quite unpredictable. The formatting process requires that the number to be formatted is a positive number. This is easily rectified by using the word ABS which gives the absolute value of a number, just as in BASIC. As the word is a double number you will need to use DABS which performs the same operation, only on a double number. The only problem remaining now is to restore the minus sign when the string is printed out. This is where the word SIGN comes into use. This will insert the minus sign into the string if the number that is TOS is negative. In this case it will be necessary to DUP the number before formatting it so that it can be tested later on by SIGN. As it is a double number 2DUP will be used. The modified version of MONEY would therefore be:

```
:  MONEY 2DUP DABS <#
   # # 46 HOLD
   #S  SIGN
   163 HOLD #> ;
```

Try this out with negative values and you will now find that it works correctly.

Some quite clever formatting can be done by changing the BASE value during formatting. For example - given a double number on TOS let's try and output it as HOURS : MINS : SECS. First we need an operator to divide by sixty to give the seconds and minutes. The following word SEC/MIN will perform this:

```
:  SEC/MIN   DECIMAL  #  (convert first digit in decimal)
          6 BASE !       (set BASE to 6                 )
        #                (convert next digit in base 6  )
   DECIMAL 58 HOLD ;     (restore BASE - insert `.'     )
```

The new word CLOCK will then use SEC/MIN as follows:

```
:  CLOCK <#       (start formatting        )
   SEC/MIN        (convert to seconds      )
   SEC/MIN        (convert to minutes      )
   #S #>          (convert remaining digits)
   CR TYPE CR ;   (print out the string    )
```

Now if you were to enter 60. CLOCK you should get 0:01:90 printed out. 12345. would print out 3:25:45. Remember the decimal point when inputting numbers. There is no error trap for a negative value but if you follow the previous example you should be able to add this to the CLOCK word. There is a time counter on the CPC464. The value of this is returned by TIME in BASIC, and this is measured in 1/300ths of a second. Next month's article (and the last in the series) will use a machine code FORTH word to return the value of TIME and use a similar type of formatting to that of CLOCK to ouptut the value. Despite the unusual format of the FORTH ASSEMBLER, machine code programmers will find FORTH an incredibly powerful language for developing machine code programs. As far as I know, no other language offers the sort of flexibility that FORTH gives - you could even create a type of 'High Level Assembler' if you wished. For machine code programmers then, next month's article should not be missed.

I will also try to take a brief look at some of the facets of FORTH that have not been touched on - mainly for the interest of programmers who may be toying with the idea of giving FORTH a try.

DATA STRUCTURES PART 2

We saw in the first part of this series on data structures, that BASJC does not provide many built-in ways of structuring data beyond variables and files.

In this installment we'll look at a special type of variable known as an array.

The one-dimensional array

Suppose you wanted to keep a record of the scores achieved by twelve students in various tests. One way this could be done would be to have a separate variable, one for each student. These could be called, for example, S1, S2, S3, ... S12. Each can have a new score added easily, as in:

```
1010 INPUT "ENTER STUDENT'S NUMBER";STN
1020 INPUT "ENTER STUDENT'S SCORE";SCR
1030 IF STN = 1 THEN S1 = S1 + SCR
1040 IF STN = 2 THEN S2 = S2 + SCR
1050 IF STN = 3 THEN S3 = S3 + SCR
```

There is a better way of doing this. Since all the students and their scores are logically related, it makes sense to treat all twelve variables as a group. This is achieved by using a type of variable called an array. An array is just like an ordinary variable but with sub-compartments. Instead of:

S1 S2 S3 S4 S5...S12

...we have:

S(0) S(1) S(2) S(3) S(4)...S(11)

This is a single variable, called S, with 12 sub-compartments, each of which has a unique identifying number.

A variable such as this is known technically as a subscripted variable or a one-dimensional array.

To use an array in a BASIC program, it is first necessary to 'declare' it. This is done in a so-called DIM statement (DIM stands for DIMension). Here's how it would be done for an array with 12 subscripts:

```
DIM S(11)
```

The name of the array appears outside the brackets, and the number in the brackets shows how many subscripts or 'cells' there are. 'But wait,' I hear you cry, '...there are only 11 subscripts'. That's because the number of the first subscript is S(0) (pronounced 'S sub zero').

Values can be assigned to, or read from, subscripted variables just as they are from ordinary variables. The only thing extra that you have to do is to specify the subscript. The value in the subscript does not have to be an actual number; it can be 'calculated' using ordinary algebraic expressions.

Before actually running the following program, try to work out what results will be printed:

```
10 DIM S(11)
20 FOR X = 0 TO 11
30 Y = 100 * X
40 S(X) = Y
50 NEXT X
60 Z = S(1) + S(5)
70 S(4) = S(6)
80 S(9) = Z
90 PRINT S(9)
100 PRINT S(4)
110 PRINT S(0)
120 PRINT S(1)
```

It is worth noting that some varieties of BASIC call the first element of an array '1' and not '0' - a point to watch out for when trying to convert programs written for other machines to run on your Amstrad.

At first sight, arrays may not appear to offer any advantages over individual, simple variables. But in fact they can make programming a lot simpler. Suppose you want to print out all the students' scores. Using simple variables, you would have to write a program segment like this:

```
PRINT S1
PRINT S2
PRINT S3
.
.
.
PRINT S12
```

...but with an array you can do this:

```
FOR LOOP = 0 TO 11
PRINT S(LOOP)
NEXT LOOP
```

Multi-dimensional arrays

The concept of the array can usefully be extended to two or more dimensions. A two dimensional array is like a grid, with rows and columns. It is sometimes helpful to organise data in this way, and easier to handle too. If, for example, you had a chain of seven retail stores and wanted to analyse their total sales month by month, you would have an excellent candidate for a two dimensional array. Actual figures might look like this:

BRANCH MONTH	CREWE	POOLE	HULL	BATH	SWANSEA	ABERDEEN	PENGE
JANUARY	12000	8000	9000	11000	6500	14000	10500
FEBRUARY	9750	7500	6500	9800	4600	11000	9500
MARCH	10000	8000	7000	10000	6000	12000	10500
. . .							
DECEMBER	14000	11000	10000	13000	9000	1500	12000

An array such as this could be set up thus:

```
10 M = 11 ' M IS MONTH
20 B = 6  ' B IS BRANCH
30 DIM SALES(M,B)
```

It is now a simple matter to calculate total sales for the chain for a given month, total sales for the year for a given branch, or even total sales for the whole year for the whole chain.

A two dimensional grid such as this is not always enough, however. Each store might have a number of separate departments, say, CLOTHES, ELECTRICAL, HOUSEHOLD and FURNITURE. If each branch returned sales figures every month separately for each department, you would need a three dimensional array to store the information. Using D to stand for 'department', you would include the statement DIM SALES(M,B,D). This array would then be equivalent to a block of cells seven across (for the branches), twelve down (for the months) and four deep (for the departments).

ACU

GRAPHICS TOOLKIT PART 3

By David Robinson

This months program is a real whopper weighing in at 342 lines - and that's without the TOOLBOX routines which we've been developing over the last two months. It's interesting to note that, apart from around 5 lines in the AIRBRUSH routine, none of this SKETCHPAD program is directly involved in drawing on the screen ! Most of the code is devoted to the interface with the program user and yet by commercial standards this program is not especially robust and is also still a tiddler.

Before looking in detail at the important areas of the program it's sackcloth & ashes time while I tell you about last month's two BLUNDERS. The first is in the REMAP JOYSTICKS routine where I forgot to redefine MOVE RIGHT! Please insert a line

```
22465 KEY DEF 75,1,243
```

The second goof was in line 10100 of the MOVE GRAPHICS CURSOR routine for the SKETCHPAD program which should be

```
10100 PLOT CX%,CY%,3
```

without which the CURSOR tends to become invisible.

Figure 1. shows an overview of the program logic with the routines being divided between COMMANDS and CURSOR MOVEMENT. The sketch was prepared by the program and saved to disk from which it can be recalled V E R Y quickly.

You should type in the program and then MERGE in the TOOLBOX routines most of which are used by the SKETCHPAD. If you haven't got the last two issues with all the necessary routines then they can be obtained by writing in for details of BACK ISSUES.

OPERATING INSTRUCTIONS.

1. CURSOR MOVEMENT can be either by JOYSTICK 0 or using the keyboard CURSOR KEYS.
2. ENTER and FIRE are used to make any individual command GO.
3. COMMAND selection is by pressing the SPACE BAR. Each press will move the current command on by one as indicated by the ladder menu on the left side of the screen.
4. FLASHING PROMPTS will guide you through each command as follows -

LINE	- set start and finish points by pressing ENTER or FIRE in response to the FIX S & FIX F prompts.
BOX	- set OPPOSITE corners of the box by pressing FIRE or ENTER.
DOTLINE	- as for LINE but enter the spacing factor as an integer between 2 & 8.
CIRCLE	- you can set the interval between points on the circumference. Next set the centre point then any point on the circumference.
ELIPSE	- as for CIRCLE but with added inputs for FLATNESS (the higher the number the flatter the shape). Note the ELIPSE routine can take an ARC parameter which has not been implemented here in the interests of brevity but you could easily add this yourself.
PAINT	- just set the start point by pressing ENTER or FIRE. The SURE ? prompt is there to ensure that you check that the start point is inside a closed shape.
AIRBRUSH	- This command only works when ENTER or FIRE is kept fully depressed. You can, however, use the MOVEMENT keys at the same time so as to pass over the surface being painted. Press DEL to return to the normal COMMAND select mode. Note that to paint whilst moving you should press ENTER or FIRE before pressing the movement keys.
TEXT	- allows you to set the start point for text entry which will end at the right margin or on pressing ENTER which ever comes first. Note that ASCII codes are printed so DEL will give a CHECK pattern.
SCREENDUMP	- choose between Amstrad or Epson types -if you have a faster version then you can subtitute calls to your own routines in lines 17075 & 17080. The SURE ? prompt is only there because the BASIC versions take a while.
ERASER	- this works like BOX but in reverse -filling your defined rectangle with BACKGROUND colour.
QUIT	- returns you to BASIC after checking that you really meant to QUIT.

The empty right hand ladder menu is there both to make the screen look tidy and for you to add some of your own commands which have been left out because of space requirements. Some obvious areas for additions are : -

1. Control over ARC in CIRCLE and ELIPSE.
2. Colour changes.
3. A fast BLOCK FILL - have a look at ERASE to see how this would be done.
4. A GRID command using repeated calls to the DRAWBOX routine.
5. Finally how about a KEYBOARD MACRO using the

KEY command of LOCOMOTIVE BASIC by saving successive keystrokes in a string which could then be allocated to a function key.

```
10 REM ********************************
20 REM ********************************
30 REM ** SKETCHPAD for AMSTRAD464  **
40 REM ********************************
50 REM ********************************
60 REM
100 GOSUB 11000      : REM INITIALISE
110 '
115 CLS
120 GOSUB 11500      : REM PRINT SCREEN
130 GOSUB 10000
200 Z$=INKEY$ : IF Z$="" THEN 200
210 IF Z$>CHR$(239) THEN CM%=ASC(Z$) : G
      OSUB 10000
220 Branch = -1*(Z$=CHR$(32))  -2*(Z$=CH
      R$(13))
230 ON Branch GOSUB 14000 , 16000
299 GOTO 200
9999 STOP
10000 REM ******************************
10010 REM *   MOVE GRAPHICS CURSOR     *
10020 REM ******************************
10030 REM
10040 PLOT CX%,CY%,CB%
10050 IF CM%=240 THEN CY%=CY%+CS% : IF C
      Y%>CYH% THEN CY%=CYH%
10060 IF CM%=241 THEN CY%=CY%-CS% : IF C
      Y%<CYL% THEN CY%=CYL%
10070 IF CM%=242 THEN CX%=CX%-CS% : IF C
      X%<CXL% THEN CX%=CXL%
10080 IF CM%=243 THEN CX%=CX%+CS% : IF C
      X%>CXH% THEN CX%=CXH%
10090 CB%=TEST(CX%,CY%)
10100 PLOT CX%,CY%,3
10110 RETURN
11000 REM ******************************
11010 REM *       INITIALISE           *
11020 REM ******************************
11030 REM
11040 COMMAND=1
11045 PARAM=1
11050 CY%=200            : REM Current Y l
      ocation
11060 CX%=320            : REM Current X l
      ocation
11070 CS%=2              : REM Cursor move
      ment speed
11080 CYH%=394           : REM Cursor Y ma
      ximum value
11090 CYL%=4             : REM Cursor Y mi
      nimum value
11100 CXH%=532           : REM Cursor X ma
      ximum value
11110 CXL%=108           : REM Cursor X mi
      nimum value
11120 GOSUB 22400        : REM Remap joyst
      icks
11130 TITLE$="SKETCHPAD for AMSTRAD CPC4
      64/664"
11135 Delay=50
11140 MODE 1
11141 MI%=2
11142 WINDOW#1,1,6,1,25
11143 WINDOW#2,35,40,1,25
11150 INK 0,13
11160 INK 1,0
11165 PLOT 1,1,1
11170 INK 2,6
11180 INK 3,0,26
11190 BORDER 26
11195 PEN 1
11200 GOSUB 20600        : REM Program fro
      nt end
11499 RETURN
11500 REM ****************************
11510 REM *   DRAW SCREEN FRAME      *
11520 REM ****************************
11530 REM
11535 GOSUB 12000
11540 Tlx=0  : Tly=399  : Brx=639  : Bry
      =0
11545 PLOT 0,0,1
11550 GOSUB 20200       : REM Drawbox
11560 PLOT 100,0
11570 DRAW 100,399,1
11580 PLOT 540,0
11590 DRAW 540,399
11600 xs%=0  : xf%=100
11610 FOR L%=12 TO 392 STEP 32
11620      PLOT xs%,L%
11630      DRAW xf%,L%
11640 NEXT
11650 xs%=540  : xf%=639
11660 FOR L%=12 TO 392 STEP 32
11670      PLOT xs%,L%
11680      DRAW xf%,L%
11690 NEXT
11999 RETURN
12000 REM ****************************
12010 REM *     PRINT COMMANDS       *
12020 REM ****************************
12030 REM
12040 DATA "LINE  ","BOX   ","DLINE ","C
      IRCLE","ELIPSE","PAINT ","BRUSH","
      FILE  ","TEXT  ","DUMP  ","ERASER"
      ,"QUIT  "
12050 RESTORE 12040
12060 FOR L%=1 TO 12
12070     READ C$
12080     LOCATE 1,L%*2
12090     IF L%=COMMAND THEN PRINT CHR$(
      24);    : REM INVERSE ON
12100     PRINT C$;
12110     IF L%=COMMAND THEN PRINT CHR$(
      24);    : REM INVERSE OFF
12120 NEXT
12199 RETURN
12500 REM ****************************
12540 Z$=INKEY$ : IF Z$="" THEN 12540
12550 IF Z$>CHR$(239) THEN CM%=ASC(Z$) :
       GOSUB 10000
12560 IF Z$<>CHR$(13) THEN 12540
12599 RETURN
14000 REM ****************************
14010 REM * CHANGE CURRENT COMMAND   *
14020 REM ****************************
14030 REM
14040 COMMAND=COMMAND+1
14050 IF COMMAND > 12 THEN COMMAND = 1
14060 GOSUB 11500              : REM PRI
      NT COMMANDS
14070 Z$=INKEY$
14099 RETURN
15500 REM ****************************
15510 REM *    CLEAR NON DRAWING     *
15520 REM ****************************
15530 REM
15535 CLS#1
15540 CLS#2
15550 RETURN
16000 REM ****************************
16010 REM * EXECUTE CURRENT COMMAND  *
16020 REM ****************************
16030 REM
16040 ON COMMAND GOSUB 16100,16200,16300
      ,16400,16500,16600,16700,16800,169
      00,17000,17100,17200
16099 RETURN
16100 REM ********** LINE ************
16105 LOCATE 35,22
16107 PEN 3
16110 SOUND 1,200,10,,7
16115 PRINT "FIX S"
16120 GOSUB 12500
16125 XS%=CX% : YS%=CY%
16127 PLOT XS%,YS%,2
16130 LOCATE 35,22
16135 SOUND 1,200,10,,7
16140 PRINT "FIX F"
16145 GOSUB 12500
16150 XF%=CX% : YF%=CY%
16152 PLOT XS%,YS%,2
16155 IF COMMAND=1 THEN DRAW XF%,YF%,2 E
      LSE IF COMMAND=3 THEN GOSUB 21500
16160 LOCATE 35,22
16165 PRINT "     "
16170 PEN 1
16199 RETURN
16200 REM ********** BOX  ************
16205 PEN 3
16210 SOUND 1,200,10,,7
16215 LOCATE 35,22
16220 PRINT "FIX T"
16225 GOSUB 12500
16230 Tlx=CX% : Tly=CY%
16235 PLOT CX%,CY%,2
16240 cb%=2
16245 LOCATE 35,22
16250 SOUND 1,200,10,,7
16255 PRINT "FIX B"
16260 PEN 1
16265 GOSUB 12500
16270 Brx=CX% : Bry=CY%
16275 PLOT CX%,CY%,2
16277 LOCATE 35,22
16278 PRINT "     "
16280 IF COMMAND=2 THEN GOSUB 20200
16285 GOSUB 10000
16299 RETURN
16300 REM ******** DOTLINE ***********
16305 LOCATE 35,20
16310 PEN 3
16315 PRINT "STEP?"
16320 LOCATE 35,22
16325 PRINT "2 - 8"
16330 z$=INKEY$ : IF z$="" THEN 16330
16335 IF z$<"2" OR z$>"8" THEN SOUND 1,1
      00,10,,7 : GOTO 16330
16340 LOCATE 35,22
16345 PRINT "     "
16350 ds=VAL(z$)
16355 GOSUB 16100
16360 LOCATE 35,20
16365 PRINT "     "
16399 RETURN
16400 REM ********* CIRCLE ***********
16405 GOSUB 16300
16410 TA%=XF%-XS%
16415 TB%=YF%-YS%
16420 R%=SQR(TA%*TA%+TB%*TB%)
16424 PLOT CX%,CY%,2
16425 CB%=2
16430 IF command=4 THEN GOSUB 22000
16435 LOCATE 35,20
16440 PRINT "     "
16499 RETURN
16500 REM ********* ELIPSE ***********
16505 PEN 3
16510 LOCATE 35,20
```

```
16515 SOUND 1,200,10,,7
16520 PRINT "FLAT%"
16525 LOCATE 35,22
16530 PRINT "1 - 9"
16535 z$=INKEY$ : IF Z$="" THEN 16535
16540 IF Z$<"1" OR Z$>"9" THEN SOUND 1,100,10,,7 : GOTO 16535
16545 FF=1-(VAL(Z$)*0.1)
16550 GOSUB 16400
16555 AR=1
16556 PEN 1
16560 GOSUB 22100
16599 RETURN
16600 REM ********* PAINT ************
16605 PEN 3
16610 LOCATE 35,22
16615 PRINT "FIX S"
16620 GOSUB 12500
16625 LOCATE 35,22
16630 SOUND 1,200,10,,7
16635 PRINT "SURE?"
16640 GOSUB 20400
16642 LOCATE 35,22
16643 PRINT "     "
16644 PEN 1
16645 IF YN$="N" THEN RETURN
16647 PLOT CX%,CY%,2
16648 XS%=CX%
16649 YS%=CY%
16650 GOSUB 21700
16655 CB%=2
16699 RETURN
16700 REM ******** AIRBRUSH **********
16705 PEN 3
16710 LOCATE 35,20
16715 PRINT "RADIUS"
16720 LOCATE 35,22
16725 INPUT z$
16730 Radius=VAL(z$)
16735 IF Radius<4 OR Radius>40 THEN 16720
16737 z$=INKEY$ : IF z$=CHR$(127) THEN 16790
16740 IF z$>CHR$(0) THEN cm%=ASC(z$) : GOSUB 10000
16755 RANDOMIZE TIME
16760 FOR L%=1 TO 2
16762 PLOT CX%,CY%
16765     R1%=INT((RND*Radius)-(Radius/2))
16770     R2%=INT((RND*Radius)-(Radius/2))
16775     IF INKEY(18)=0 OR INKEY(76)=0 THEN PLOTR R1%,R2%,2
16780 NEXT
16785 GOTO 16737
16790 LOCATE 35,20
16791 PRINT "      "
16792 LOCATE 35,22
16793 PRINT "      "
16794 PEN 1
16799 RETURN
16800 REM ********** FILE ************
16805 PEN 3
16810 LOCATE 35,20
16815 PRINT "L/S ?"
16820 Z$=INKEY$ : IF Z$="" THEN 16820
16825 Z$=UPPER$(Z$)
16830 IF Z$<>"L" AND Z$<>"S" THEN 16820
16835 LOCATE 35,20
16840 PRINT "NAME?"
16845 LOCATE 35,22
16850 INPUT FLNAM$
16851 LOCATE 35,22
16852 PRINT "     "
16855 LOCATE 35,20
16860 PRINT "SURE?"
16865 GOSUB 20400
16866 LOCATE 35,20
16867 PRINT "     "
16868 PEN 1
16870 IF YN$="N" THEN 16890
16875 IF Z$="S" THEN GOSUB 15500 : GOSUB 22200
16880 IF Z$="L" THEN GOSUB 22300
16890 GOSUB 11500
16899 RETURN
16900 REM ********** TEXT ************
16905 LOCATE 35,22
16910 PEN 3
16915 PRINT "FIX S"
16920 GOSUB 12500
16925 HP%=1+CX%/16
16930 VP%=25-CY%/16
16935 LOCATE 35,22
16940 PRINT "ENTER"
16942 PEN 2
16945 LOCATE HP%,VP%
16950 Z$=INKEY$ : IF Z$="" THEN 16950
16955 IF Z$=CHR$(13) OR HP%>=34 THEN 16990
16960 PRINT Z$;
16965 HP%=HP%+1
16970 GOTO 16950
16990 LOCATE 35,22
16995 PRINT "     "
16997 PEN 1
16999 RETURN
17000 REM ******** SCREENDUMP ********
17005 LOCATE 35,20
17010 PEN 3
17015 PRINT "DUMP"
17020 LOCATE 35,22
17025 PRINT "SURE?"
17030 SOUND 1,200,10,,7
17035 GOSUB 20400
17040 IF YN$="N" THEN 17099
17045 LOCATE 35,22
17050 PRINT "     "
17055 LOCATE 35,20
17060 PRINT "A or E"
17065 Z$=INKEY$ : IF Z$="" THEN 17065
17070 Z$=UPPER$(Z$)
17075 IF Z$="A" THEN GOSUB 15500: GOSUB 20800 : GOTO 17090
17080 IF Z$="E" THEN GOSUB 15500: GOSUB 21100 : GOTO 17090
17085 GOTO 17065
17090 LOCATE 35,20
17095 PRINT "     "
17097 PEN 1
17098 GOSUB 11500
17099 RETURN
17100 REM ********* ERASER ***********
17105 GOSUB 16200
17110 LOCATE 35,22
17115 PEN 3
17120 PRINT "SURE?"
17125 GOSUB 20400
17130 IF YN$="N" THEN 17190
17135 IF Tly>Bry THEN ST=-1 ELSE ST=1
17140 FOR L=Tly TO Bry STEP ST
17145     PLOT Tlx,L,0
17150     DRAW Brx,L,0
17160 NEXT
17165 GOSUB 10000
17190 LOCATE 35,22
17195 PRINT "     "
17197 PEN 1
17199 RETURN
17200 REM ********** QUIT ************
17202 FOR L=1 TO 5
17203     SOUND 1,200,10,7
17204     SOUND 1,500,20,7
17207 NEXT
17210 LOCATE 35,18
17212 PEN 3
17215 PRINT "SURE?"
17217 PEN 1
17220 GOSUB 20400          : REM YES/NO
17225 IF YN$="Y" THEN CLS : STOP
17230 LOCATE 35,18
17235 PRINT "     "
17299 RETURN
20200 REM ****************************
20210 REM *         DRAWBOX          *
20220 REM ****************************
20230 REM
20240 PLOT Tlx,Tly
20250 DRAW Brx,Tly
20260 DRAW Brx,Bry
20270 DRAW Tlx,Bry
20280 DRAW Tlx,Tly
20290 RETURN
20400 REM ****************************
20410 REM *         YES / NO         *
20420 REM ****************************
20430 REM
20440 YN$=INKEY$ : IF YN$="" THEN 20440
20450 YN$=UPPER$(YN$)
20460 IF YN$<>"Y" AND YN$<>"N" THEN 20440
20470 RETURN
20600 REM ****************************
20610 REM *    PROGRAM FRONT END     *
20620 REM ****************************
20630 REM
20640 CLS
20650 Tlx=0 : Tly=398 : Brx=639 : Bry=1
20660 GOSUB 20200
      : REM DRAWBOX
20670 Tlx=10 : Tly=388 : Brx=630 : Bry=11
20680 GOSUB 20200
      : REM DRAWBOX
20690 LOCATE 20-INT(LEN(TITLE$)/2),10
20700 PRINT TITLE$
20710 LOCATE 3,14
20720 PRINT "Press   S P A C E   B A R   to start"
20730 z$=INKEY$ :IF Z$<>CHR$(32) THEN 20730
20740 RETURN
20800 REM ******************************
20810 REM *        SCREEN DUMP         *
20820 REM ******************************
20830 DIM i%(320)
20840 pixln=413
20850 FOR k%=1 TO 28
20860 pixln=pixln-14
20870 FOR l%=1 TO 319
20880 GOSUB 20980
20890 i%(l%)=p1%+p2%+p3%+p4%+p5%+p6%+p7%
20900 NEXT
20910 PRINT#8,CHR$(27);CHR$(75);CHR$(2);CHR$(64);
20920 FOR j%=1 TO 320 : PRINT#8,CHR$(i%(j%)); : NEXT
20930 PRINT#8,CHR$(i%(320))
20940 NEXT
20950 PRINT#8,CHR$(15)
20960 ERASE i%
20970 RETURN
20980 p1%=(TEST(l%*2,pixln)>0)*-1
20990 p2%=(TEST(l%*2,pixln-2)>0)*-2
21000 p3%=(TEST(l%*2,pixln-4)>0)*-4
21010 p4%=(TEST(l%*2,pixln-6)>0)*-8
21020 p5%=(TEST(l%*2,pixln-8)>0)*-16
21030 p6%=(TEST(l%*2,pixln-10)>0)*-32
21040 p7%=(TEST(l%*2,pixln-12)>0)*-64
21050 RETURN
21100 REM ******************************
21110 REM *  EPSON TYPE SCREEN DUMP    *
21120 REM ******************************
```

```
21130 DIM i%(320)
21135 PRINT#8,CHR$(27);CHR$(65);CHR$(6)
21140 pixln=413
21150 FOR k%=1 TO 28
21160 pixln=pixln-14
21170 FOR l%=1 TO 320
21180 GOSUB 21280
21190 i%(l%)=p1%+p2%+p3%+p4%+p5%+p6%+p7%
21200 NEXT
21210 PRINT#8,CHR$(27);CHR$(75);CHR$(65)
      ;CHR$(1);
21220 FOR j%=1 TO 320 : PRINT#8,CHR$(i%(
      j%)); : NEXT
21230 PRINT#8
21240 NEXT
21250 PRINT#8,CHR$(27);CHR$(65);CHR$(12)
21260 ERASE i%
21270 RETURN
21280 p1%=TEST(l%*2,pixln)*64
21290 p2%=TEST(l%*2,pixln-2)*32
21300 p3%=TEST(l%*2,pixln-4)*16
21310 p4%=TEST(l%*2,pixln-6)*8
21320 p5%=TEST(l%*2,pixln-8)*4
21330 p6%=TEST(l%*2,pixln-10)*2
21340 p7%=TEST(l%*2,pixln-12)
21350 RETURN
21500 REM ******************************
21510 REM *       DOTTED LINE          *
21520 REM ******************************
21530 REM
21540 TA%=XF%-XS% : TB%=YF%-YS%
21550 TQ=SQR(TA%*TA%+TB%*TB%)
21560 TX=TA%/TQ : TY=TB%/TQ
21570 FOR L=0 TO TQ STEP DS : XP%=XS%+L*
      TX : YP%=YS%+L*TY : PLOT XP%,YP% :
      NEXT
21580 RETURN
21700 REM ******************************
21710 REM *          PAINT             *
21720 REM ******************************
21730 REM
21740 DIM XP%(200) : DIM YP%(200)
21750 HEAD%=0 : TAIL%=0
21760 GOSUB 21860
21770 TAIL%=(TAIL%+1) MOD 200
21780 XT%=XP%(TAIL%)
21790 YT%=YP%(TAIL%)
21800 IF TEST(XT%+1*MI%,YT%)=0 THEN XS%=
      XT%+1*MI% : YS%=YT% : GOSUB 21860
21810 IF TEST(XT%-1*MI%,YT%)=0 THEN XS%=
      XT%-1*MI% : YS%=YT% : GOSUB 21860
21820 IF TEST(XT%,YT%+2)=0 THEN XS%=XT%
      : YS%=YT%+2 : GOSUB 21860
21830 IF TEST(XT%,YT%-2)=0 THEN XS%=XT%
      : YS%=YT%-2 : GOSUB 21860
21835 IF INKEY$=CHR$(127) THEN RETURN
21840 IF HEAD%=TAIL%+1 THEN ERASE XP% :
      ERASE YP% : RETURN
21850 GOTO 21770
21860 PLOT XS%,YS%
21870 HEAD%=(HEAD%+1) MOD 200
21880 XP%(HEAD%)=XS% : YP%(HEAD%)=YS%
21890 RETURN
21900 REM ******************************
21910 REM *     DRAW TRIANGLE          *
21920 REM ******************************
21925 REM
21930 WOFFS%=BASE/2 : HOFFS%=HI/3
21940 X1%=X0%-WOFFS% : Y1%=Y0%-HOFFS%
21950 X2%=X0% : Y2%=Y0%+2*HOFFS%
21960 X3%=X0%+WOFFS% : Y3%=Y0%-HOFFS%
21970 PLOT X1%,Y1% : DRAW X2%,Y2%
21980 DRAW X3%,Y3%
21990 DRAW X1%,Y1% : RETURN
22000 REM ******************************
22010 REM *        DRAW CIRCLE         *
22020 REM ******************************
22030 REM
22035 DS=DS/180
22040 FOR L=0 TO 2*PI STEP DS
22050 XP%=R%*COS(L) : YP%=R%*SIN(L)
22060 PLOT XS%+XP%,YS%+YP%
22070 NEXT
22080 RETURN
22100 REM ******************************
22110 REM *       DRAW ELLIPSE         *
22120 REM ******************************
22130 REM
22140 DS=DS/180
22150 FOR L=0 TO 2*PI STEP DS
22160 XP%=R%*COS(L*AR) : YP%=R%*FF*SIN(L
      *AR)
22170 PLOT XS%+XP%,YS%+YP%
22180 NEXT
22190 RETURN
22200 REM ******************************
22210 REM *       SAVE SCREEN          *
22220 REM ******************************
22230 REM
22240 SPEED WRITE 1
22250 SAVE "!" + FLNAM$,B,&C000,&4000
22260 SPEED WRITE 0
22270 RETURN
22300 REM ******************************
22310 REM *        SCREEN LOAD         *
22320 REM ******************************
22330 REM
22340 LOAD "!" + FLNAM$
22350 RETURN
22400 REM ******************************
22410 REM *     REMAP JOYSTICKS        *
22420 REM ******************************
22430 REM
22440 KEY DEF 72,1,240    : REM UP
22450 KEY DEF 73,1,241    : REM DOWN
22460 KEY DEF 74,1,242    : REM LEFT
22465 KEY DEF 75,1,243
22470 KEY DEF 76,1,13     : REM FIRE 2
22480 KEY DEF 77,1,13     : REM FIRE 1
22490 RETURN
```

ACU

GALLUP SOFTWARE CHART



4 weeks up to
14/5/1985

	TITLE Publisher	Last Month	Months in chart			Market Strength
1	KNIGHT LORE Ultimate	-	NE	664	-	100
2	DALEY THOMPSON'S DECATHLON Ocean	-	NE		-	79
3	GHOSTBUSTERS Activision	1	▼		1	78
4	SORCERY Virgin	-	NE		-	73
5	COMBAT LYNX Durrell	18	▲		1	48
6	FIGHTER PILOT Digital Intergration	3	▼	664	1	45
7	JET SET WILLY Software Projects	2	▼		1	36
8	EMERALD ISLE Level 9	9	▲	D 664	1	29
9	MINI OFFICE Database Publications	5	▼	D 664	1	28
10	STEVE DAVIS SNOOKER CDS	7	▼		1	24
11	KONG STRIKES BACK Ocean	-	NE		-	19
12	WILD BUNCH BT Firebird	17	▲	664	1	18
13	VAMPIRE KILLER Mastertronic	-	NE		-	17
14	3D STARSTRIKE Realtime	-	NE	664	-	13
15	BATTLE FOR MIDWAY P.S.S.	-	NE		-	12
16	HUNCHBACK II Ocean	-	NE		-	11
17	HUNCHBACK Ocean	-	NE	664 A	-	10
18	TANK BUSTERS Design Design	-	NE	664	-	9
19	MINDER DK' Tronics	-	NE	664	-	8
20	MANIC MINER Software Projects	11	▼	D A	1	7

D Available on Disc — 664 CPC 664 Compatible — A Available from Amsoft

The Gallup software chart is compiled for the trade magazine - Computer and Software Retailing.

ADVENTURE CREATOR

For just £2.99 you can buy THE AMSTRAD PENTACLE, a program which takes all the hard work out of writing adventures on the Amstrad. Just type in the program provided in our £2.99 book, THE AMSTRAD PENTACLE, and follow the instructions, and you'll be creating your own, original adventures. It comes complete with a full set of data for the medieval adventure *Castle of Doom*. So, for just £2.99, you get the book THE AMSTRAD PENTACLE which contains the full listing of the adventure-creating program, full instructions, and a complete set of data for the *Castle of Doom* adventure. You can even market the adventures you write with this package – without paying a penny in royalty!

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+ ERASE OR RENAME PROGRAMS
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A comprehensive machine code editor and disassembler
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PRINTER PAC 1

A printer enhancement program for the DMP1 and Epson compatible printers such as the Shinwa CPA80, and Epson RX80.

Features include:
+ SCREEN DUMP IN ALL MODES
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2 program pack which is a must for DMP-1 printer owners. Offers 6 definable character fonts.

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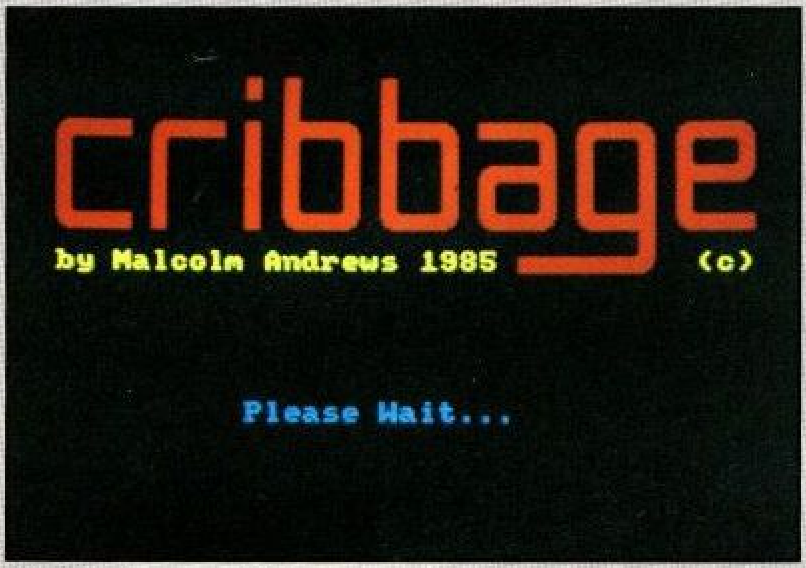
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THE FORCES OF LIGHT & DARK BATTLE IT OUT IN
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THE ULTIMATE ACTION & STRATEGY PROGRAM FOR YOUR CBM 64
NOW AVAILABLE ON
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AMSTRAD CPC464
ATARI 600/800XL
(CASSETTE & DISK)
including FREE ENAMEL METAL BADGE OFFER
STAR GAME
ARCHON is brilliant. There's something in it for all games addicts; arcade, adventure and strategy are all here. My only complaint is that it's best played against a human opponent – the computer's just too good and you can't give it a handicap.
Bryan Skinner
Personal Computer News
ARCHON
from Electronic Arts
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U.S. TOP 10 HIT
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HIGH PERFORMANCE PROGRAMS

Competition Time.

Having judged the latest entries for the Amstrad Software Competition, it was encouraging to see the increasing number of entries on disc. Machine code, however, particularly in the arcade games, was sorely missed.

As with the previous months competitions the judges were looking for more than just programming ability. Presentation and the standard of the documentation also played a part.

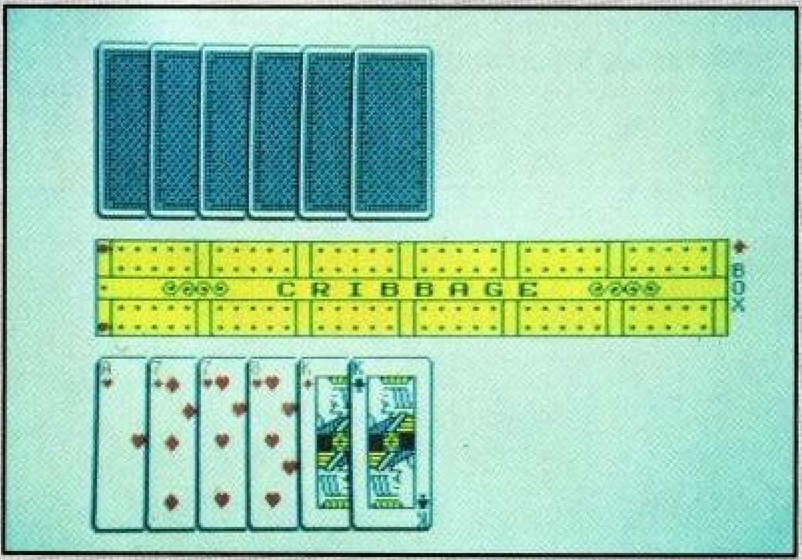
The new flexi-prize system improved things greatly; therefore this month there are five winners. They take the form of a first prize and four runners up. The big winner is



Mr M Andrews - Cribbage

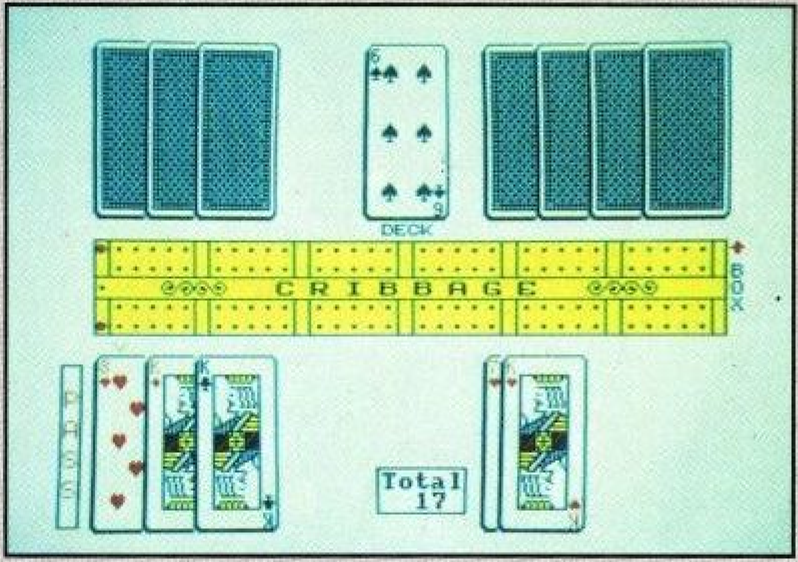
Mr M Andrews for his cribbage program. He wins '600. The remainder of the '2,000 goes to D.L. Lau for P*cman goes planting, Mr Livesey for Astro-Pac, Mr A J Brook for his banking program and to Mr Speekman for his Duck Dodgers arcade game. They each receive '350.

It is worth spending some time to look at each of the programs in turn.



Mr M Andrews - Cribbage

Cribbage fully deserved to win. The program plays according to the rules of the game and the graphics are beautifully drawn. Everything from the slowly produced title page to the input routines within the game are well executed.



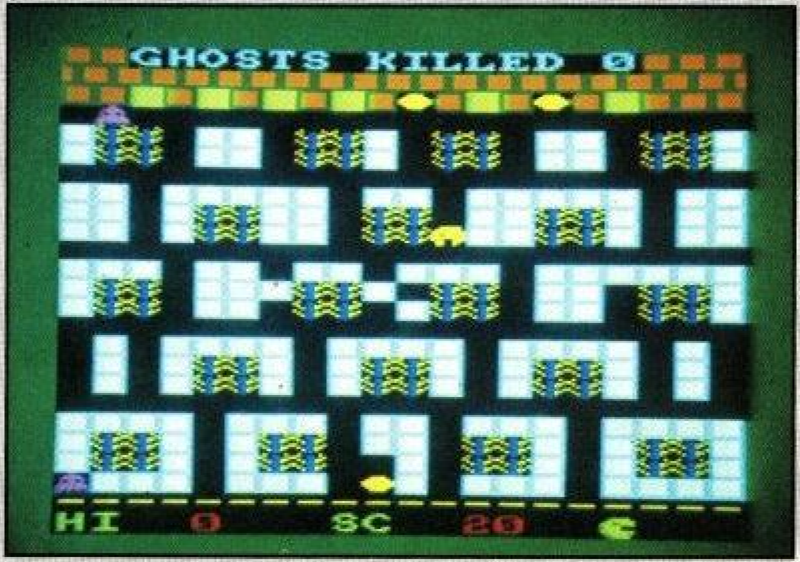
Mr M Andrews - Cribbage

The four other programs show how difficult it is to seperate programs covering different topics.



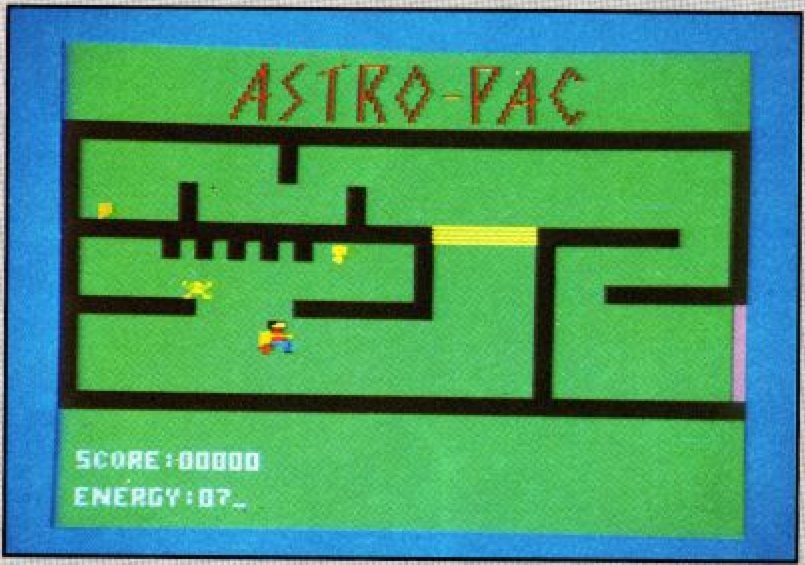
D.L. Lau - P*man goes Planting

P*cman goes planting, wasn't quite called that but this magazine doesn't want to upset anyone.It features the horticultural exploits of a yellow disc-shaped creature who



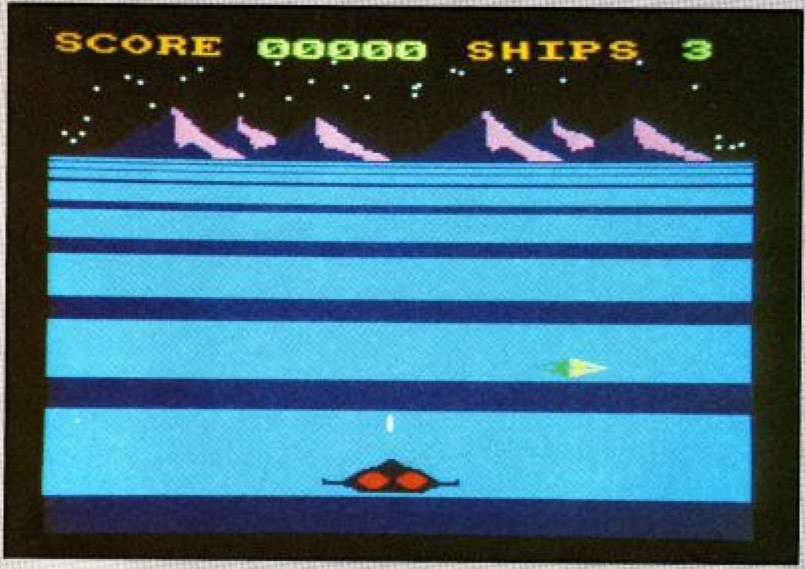
D.L. Lau - P*man goes Planting

goes about planting things in his garden. The game was fun because it presented just the right degree of difficulty, and contained a variety of hazards. The sheets become progressively more difficult and it looks to be a good candidate for later listing in the magazine.



Mr Livesey - Astro-Pac

Astro-Pac is a spaceman in a maze game. To play you have to fly your little astronaut around a maze using left, right and thrust controls. Hitting an alien or a force-field saps your energy. This is precious and has to be refilled. The multi-coloured spaceman character moves smoothly and the maze is well designed. As with the other winners the game played well. Some of the rooms proved to be too difficult too early. With twelve rooms it will take some time to master.



Mr Speekman - Duck Dodgers

Duck Dodgers is based on the "Buck Rogers and the Planet of Zoom" arcade game, this makes the title the least exciting thing about the program. The title pages are neat with with extra large D's for the programs name. The backdrop contains some pretty shaded moutains and the terrain in the first sheet is made to move by the use of palette switching. Some of the movement is a bit jerky but otherwise this is a very nice game.

The final winner is a bit different. Banking won a prize because it is genuinely useful. The author, Alan Brook, wrote it for his own use and it is one of the few applications of a tape based computer system which benefits from the power of the computer instead of using it as an expensive note book.



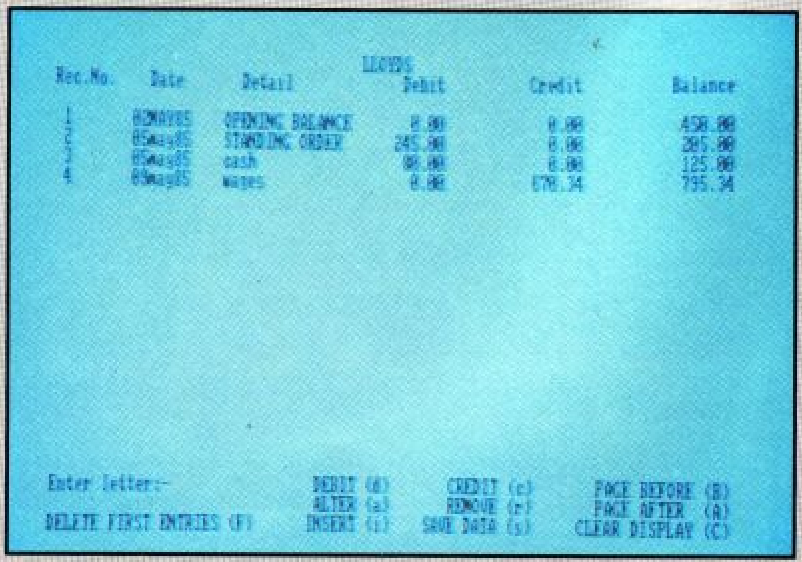
Mr Speekman - Duck Dodgers



Mr Speekman - Duck Dodgers

The feature include the automatic accounting for standing orders, and handy routines for updating the database.

If you enter the competition please remeber to include your name and address in Rem's at the beginning of the program or as a loader program. You should also mark the tape or disc with this information. Amstrad look forward to your future entries. ACU



Mr A J Brook - Banking

£2,000 program competition!

Think what you could buy with a £2,000 windfall...

The objective couldn't be simpler: write the best program submitted to the AMSTRAD USER review panel. Every other month £2,000 will be shared amongst the very best entries.

RULES

1 The winner(s) will be the entrant or entrants who submit the best program. It may be any piece of software that runs on the CPC464 or CPC664

2 The name of all the winners will be printed in the next available issue of Amstrad User.

3 All entries must arrive by August 1st 1985. Entries arriving after that date will be included in the next issue's competition.

4 All entries must INCLUDE a disc or cassette copy of the program with some codes where application (plus loading instructions where necessary!), AND A SIGNED COMPETITION ENTRY FORM.

A full listing would be helpful, but not essential. A brief summary of the program and its purpose should accompany all entries.

5 All entries will be treated in strict confidence

6 Neither AMSOFT nor AMSTRAD can be held to be responsible for any loss or damage to any submission.

7 No correspondence can be entered into concerning programs submitted for the cash prize competition.

8 The decision of the judges is final.

9 It is a condition of entry that all entrants have exclusive ownership of the copyright of the material submitted, and that the winners agree to assign all copyright in the winning program to Amstrad.

All entrants must undertake not to submit the same or a similar program to any other magazine, publisher or organisation until after the announcement of the winning entry.

10 Amsoft may offer to publish programs either in Amstrad User or as commercial software, in which case Amsoft will agree the terms on an individual basis with the author(s) concerned. Amsoft reserves the right to amend, alter or revise any program that is publishes.

11 No employees of Amsoft or Amstrad, or their relatives may enter this competition.

12 All entries must have the name and address of the programmer as REM's in the first few lines of the program or loader.

HOW TO ENTER:

Think about your program, and map it out in a series of events or features. Write the program onto cassette, based around these events and check that the program runs as intended. Once you are satisfied, send a copy of the cassette in a suitable envelope along with the following:

1) A brief summary of the program in 500 words or less.

2) The completed competition entry form, which must be signed.

3) Program listings, if available.

4) SAE if you want your entry returned.

SOFTWARE *COMPETITION*

No entry is valid unless accompanied by this official entry form.
Only User Club members are elgible to enter.

User Club Membership Number ....
Name ....
Address ....
....
Postcode ....
Telephone number ....

***NB All programs must be submitted in UNprotected form. Preferably on disc.**
I have read the rules published in AMSTRAD COMPUTER USER, and agree to be bound by them.

I have enclosed:

- ☐ **tape/disc**
- ☐ **listing**
- ☐ **SAE for the return of my entry**
- ☐ **A summary of up to 500 words**

I am over 18 years of age. YES/NO: Age if under 18 ....

(The signature of a parent or guardian is required where the entrant or the nominated representative of the entrants is under 18 years of age.)

SIGNATURE .... **Date** ....

Program Name ....

SHINECREST

COMPUTER WORKSTATIONS AND DESKS

The latest addition to the Shinecrest range has been enthusiastically received by both dealers and home computer owners for providing all the facilities a computer user could require. Shown in our photograph with the Amstrad CPC464 you can see there remains plenty of space both behind and alongside the computer. The raised shelf provides ample room for your monitor, and if you choose, a printer. Any weight will be easily supported as all the shelves are fitted to two metal rails which travel the full width of the desk and locate into the metal ends. Castors provide an often needed mobility for your desk. The shelves are supplied in a Teak woodgrain finish to compliment the dark metalic brown painted metal rails and end frames.

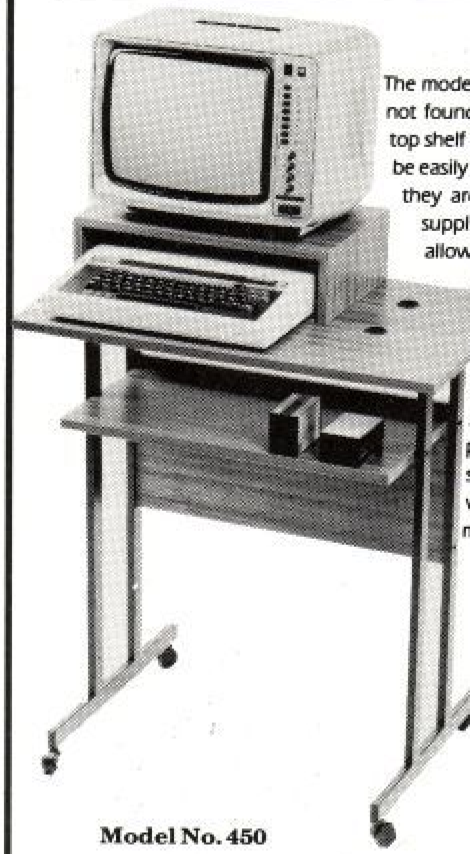
At the back of the desk there is ample space above and below the courtesy panel for interconnecting leads and paper feed to the printer. Every requirement has been provided for.

Dimensions		
	Distance between top and middle shelf	146 mm (5 3/4")
	Distance between middle and bottom shelf	216 mm (8 1/2")
	Depth of plinth	292 mm (11 1/2")
	Depth of bottom shelf	320 mm (12 1/2")
	Width	983 mm (36 3/4")
	Depth	610 mm (24")
	Height	889 mm (35")

PRICE £69-95



Model No. 600



The model 450 workstation has many features not found on large desks twice the cost. The top shelf has 3 large holes to allow the leads to be easily fed to the back of the unit. Once here they are all fed into a 4 into 1 masterplug supplied with the workstation, thus allowing just one lead (supplied) to be required for mains electricity. The pre formed plinth is moveable allowing it to be used either left or right "handed". Fitted to the bottom edges is a non slip rubber strip making your monitor safe. The painted metal frame provides substantial strength and stability whilst the fitted castors allow easy mobility.

Model No. 450



Model No. 500

An attractive piece of computer furniture the model 500 also provides all the computers users requirements. A full width monitor shelf allows easy left or right handed operation whilst still providing space for the printer. The large work surface gives plenty of room for your Amstrad computer with ample "working room" still available. A unique Shinecrest development allows the desk to be mobile by the fixing of 2 painted metal castor supports. The very large courtesy panel ensures that the desk is stable and solid and will not "rock" like some models available. The back is "cut away" to allow unobtrusive removal of leads. The model 500 is available in a Teak woodgrain finish.

Dimensions		
	Depth of plinth	296 mm (11 1/2")
	Width of plinth	478 mm (18 3/4")
	Distance between lower shelf and working shelf	178 mm (7")
	Width	762 mm (30")
	Depth	500 mm (19 3/4")
	Height	743 mm (29 1/4")

PRICE £59-95

Dimensions		
	Depth of plinth	296 mm (11 1/2")
	Distance between top and middle shelf	130 mm (5")
	Width	965 mm (38")
	Depth	590 mm (23 1/4")
	Height	865 mm (34")

PRICE £54-95

Shinecrest Products Ltd. are a well established company supplying many major Electronic companys including Amstrad. Our range of products are sold by such outlets as Harrods, Selfridges and D.H. Evans.

To obtain your computer desk or work station we suggest you purchase at any of the following dealers:-

Spectrum Dealers, 3D Computers, Ramco, Sewards, P.H. Electronics, Colchester Co-ops, Oxford & Swindon Co-ops, Trionic, and from most AMSTRAD Stockists.

In the unlikely event that you are unable to obtain the product you require, please contact Shinecrest at the address below, who will provide the name and address of your nearest stockist.

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Amstrad CPC464

Speech Synthesizer

The dk'tronics Amstrad speech synthesizer and powerful stereo amplifier uses the popular SLO/256 speech chip and has an almost infinite vocabulary. It is supplied with a text to speech converter for ease of speech output creation. Everything you wish to be spoken is entered in normal English, without special control codes or characters, it is therefore extremely easy to use. The voicing of the words is completely user transparent and the computer can carry on its normal running of a program while the speech chip is talking. The speech output from SLO/256 is mono and directed to both speakers.

Stereo Output

To utilise the Amstrad stereo output on the back of the computer, the interface has a built in stereo amplifier, this gives all sound output a totally new dimension and greatly improves the sound quality and volume over the computer's internal speaker. Any sound that previously came out of the mono speaker will now be sent out via the interface in stereo. All programs that use the sound in anyway (i.e. commercial software) will now output through the interface, which is fitted with volume and balance controls.



Speech Synthesis

The Amstrad speech synthesis utilises parts of the spoken word known as allophones. These are actual sounds that go to make up speech. The SP0256 allophone speech synthesis technique provides the ability to synthesize an almost unlimited vocabulary. Fifty-nine discrete speech sounds (allophones) and five pauses are stored in the speech chip's internal rom.

Text to Speech

Although there are only 26 letters in the alphabet, letters have a totally different sound when used in different words. For example, The "a" in 'Hay' is much longer and softer than in 'Hat'. When you speak you automatically make adjustments because you know just how a word should sound Not quite so easy with a computer.

The machine code software is mainly developed to this mode of operation. 3.5K is used for tables which contain the rules & exceptions to the rules of the English Language.

e.g. I before E except after C) This therefore allows the user to enter words to be spoken in normal English.

Speakers

Supplied with the Speech Synthesizer are two high quality 4" speakers these have been designed to compliment theAmstrad Computer. They are fitted with 1 metre of cable and can be positioned for the best stereo effect. The synthesizer interface fits neatly on to the rear of the computer. It has a through connector to enable other interfaces (e.g. Disc Drive) to connect to the rear of the synthesizer for ease of expansion Please send S.A.E. for a copy of the instruction manual which will give full and comprehensive details.

New Basic Commands

There are 8 new Basic Commands which control all the functions of the interface. Making the Synthesizer very easy to use. You can even control the speed at which it will talk to you. Or use the synthesizer to create sound effects like a fourth sound channel.

10 PRINT " 'AMSTRAD' "

The above is an example of the Syntax for entering speech into the computer and shows how simple it is to use.

The instruction book gives comprehensive details and examples of how to use the interface both from machine code and basic.

How to Order

The Amstrad Speech Synthesizer costs only £39.95. You can obtain your synthesizer through any good computer store or by completing the order form and returning it to:
dk'tronics Limited, Shire Hill, Saffron Walden, Essex. OR by telephone quoting your barclaycard or access number. Orders normally despatched within 24 hours.

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